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ABSTRACT

This document is the second volume in a 5-part series that reports the results of a project undertaken to critically review and analyze major longitudinal studies of child and student development. These studies were conducted to discover the variables, techniques, methodologies, and problems pertinent to evaluate studies of the effects of schools and colleges on the growth and development of children and young adults. It was anticipated that study results would provide guidelines for the future research needed to enhance educational program planning, implementation, and evaluation. This volume contains the dynamics of the development of the abstracting process underlying the study, the elements of the process, the typology of the variables included in the research, an overview of major issues suggested by the research reviewed as well as by the review process, and the abstracts themselves. The document also provides a critical appraisal of each study's major issues and objectives and assesses their relevance to educational research. Related documents are EA 005 321 and EA 005 323-325. (Author/DN)

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# AN ANALYTICAL REVIEW OF LONGITUDINAL AND RELATED STUDIES AS THEY APPLY TO THE EDUCATIONAL PROCESS

## TOWARDS SYNTHESIS

## VOLUME II

by

Clare Rose
James W. Trent
Ann Salyard
Judd Adams

June, 1972

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# PREFACE

The present monograph is the second of a series of five volumes underway to present the results of the Analytical Review of Longitudinal Studies, sponsored by the National Center for Educational Statistics of the U.S. Office of Education. The project is designed to analyze selected major longitudinal studies in order to discover variables, techniques, methodologies and problems pertinent to evaluative studies of the effects of schools and colleges on the growth and development of children and young adults.

Volume II contains the dynamics of the development of the abstracting process underlying the study, the elements of the process, the typology of the variables included in the research, an overview of major issues suggested by the research reviewed as well as by the review process, and the abstracts themselves. Subsequent volumes emphasize the research methodology and techniques, instrumentation, and the synthesis and implications of the findings.

The enormous and difficult task of sifting and re-sifting through seemingly countless documents, forms, and data has been made possible through the exceptional cooperation of involved individuals. Those researchers whose studies are under review who have been particularly helpful include Jerald Bachman, Thomas Hilton, Majorie Honzik, Torsten Husen, Theodore Newcomb, and Dale Tillery. Linda Adams, Barbara Dorf, Sandra Frith, Ronald Hart, Glen Nyre, and particularly Ann Salyard and Roberta

Malmgren were instrumental in carrying out the abstracting process. Irene Chow, Lani Feldbaum, and especially Rose Chin and Jan Newmark have been diligent in producing the numerous project documents. Albert Marcus has contributed exceptionally to the substantive development of the project. Above all, Judd Adams and Clare Rose have been vital to the management and development of the project.

James W. Trent
Principal Investigator

VOLUME II

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# INTRODUCTION

Schools, now as in the past, are beseiged by enormous problems. These problems have become so severe over time that it is almost a cliché to say that they have never been so great as now. Schools have the charge to prepare youth for an uncertain society in the throes of a radical technological and cultural evolution. As a result, unprecedented demands are being made of the schools while established society is at the same time reacting with categorical criticism of the schools and increased withdrawal of their financial support for them.

This situation has rendered schools particularly accountable for their effectiveness. Obviously, the main measure of schools' effectiveness is the outcomes of their students. Information about the effects of schools and their programs on student outcomes, however, is very limited. Understanding the development of students through the educational process has never been sufficient nor easily gained.

The problem is not so much a matter of lack of research on the subject, as witnessed by the extensive review of research on early childhood and adolescence provided by the Hoffmans (1966; 1964) and the equally extensive review of research on college-age youth provided by Feldman and Newcomb (1969). The problem is rather that there has been insufficient synthesis, critical examination, evaluation and application of the research to major topics that bear on the influence of schools on students as they progress through different ages.

The Hoffmans and particularly Feldman and Newcomb offer a very useful start in this direction. The two volumes the Hoffmans assembled reviewing research on child development are comprehensive; they cover the age range of early childhood through adolescence and include overviews of diverse topics such as development of language, concepts, thinking, attitudes, occupational roles, and socialization in reference to the family, classroom, and larger society. Yet, by nature of the objectives of their volumes, what remains are just that: overviews of the theory and research in child development. There is no systematic evaluation of measurement or research procedures involved in dealing with key variables across age groups and school settings.

Feldman and Newcomb conducted what may be viewed as an exceptional "analysis of four decades of research" on the impact of colleges on students. They covered the question of stability and change during and, to some extent, after the college years in reference to diversity of students' and faculty background and characteristics, institutions, major fields and residence groupings. They indicated consensus of findings regarding major variables and provided relevant composite charts of findings, samples, research instruments used, and the sources of the research. They also included pertinent notes on problems of interpretation and methodology. The scope of this review, however, did not entail a systematic evaluation of instruments, measurements and items used, critical combinations and interactions of variables, or adequate and inadequate procedures of research and sampling design and methodology.

Much remains to be done in this context, including the identification, synthesis and evaluation of the following:

1. Variables associated with the influence of the family and school environment and processes on student development within and among different age groups.
2. Convergent information about these variables which is essential as a reference point for policy planning and implementation of needed improvements in the educational system.
3. Divergent or missing information about key variables indicating the nature and direction of additional research needed for program planning and development.
4. Redundant and non-productive research.
5. Effective research strategies, methodology and instrumentation needed in this context.
6. Availability and accessability of data banks which would be of use in further research on the educational process.

## THE ANALYTICAL REVIEW

The information needs outlined above provided the basis for the research objectives of the present Analytical Review of Longitudinal and Related Studies. Under the auspices of the National Center for Educational Statistics of the U.S. Office of Education, the Higher Education Project of UCLA's Center for the Study of Evaluation undertook an intensive critical review and analysis of a select group of paramount longitudinal and cross-sectional studies which explored the growth and development of diverse kinds of students during and after their stay in various formal educational environments. Greatest emphasis was placed upon students and comparable non-student populations between the ages of 14 and 30, but attention was also given to early childhood. The Project was designed to contribute guidelines to research and data needed as well as to an Office of Education sponsored project, the Longitudinal Study of Educational Effects, projected to help meet this need.

The specific objectives of the Analytical Review project were as follows:

1. To provide a comprehensive summary of each research study. The summaries are presented in elaborated abstract form. The components of the abstracts include a description of the major issues and objectives; research design, sample and sampling procedures; variables studied; measurements and instruments; statistical design and procedures; major findings; conclusions and recommendations.

2. To provide a critical appraisal of each study's major issues and objectives, assessing their relevance to educational research, their means of assessment and determination of their attainment.

3. To provide a critical appraisal of the research design of each study including assessment of its appropriateness to the stated objectives of the study and its contribution to the development of refined research strategies appropriate to the Longitudinal Study of Educational Effects. Specifically, this objective entailed an assessment of the conceptualization of the phenomena under investigation; choice and selection of appropriate samples; choice of statistical design; and implementation of the design.

4. To identify and critically assess the range of variables under investigation in order to determine which classes of variables have been adequately studied, those which need further study and which additional classes of variables ought to be studied.

5. To identify the instruments and measurements used in each study and assess their relative merit in terms of their reliability, validity, format, administration feasibility, applicability to the stated objectives of the study and applicability to the Longitudinal Study of Educational Effects.

6. To critically assess the appropriateness of the statistical design and procedures relative to the stated objectives of the study and to identify those applicable to the proposed Longitudinal Study of Educational Effects. More specifically, the objective was to assess the appropriateness of the statistical models, the match between the statistical procedure and the data; problems in making inferences; problems in measuring change; and finally, to suggest more refined statistical procedures for measuring the impact of education on students.

7. To organize the major findings of each study, identify convergence and divergence of findings; organize them into models illustrating the interrelationship among the variables and identify those variables important in the prediction and understanding of student growth and development.

8. To provide a reference manual or "User's Guide" to attempt to facilitate access to the information gathered by the Analytical Review.

The first phase of the project was concerned with a descriptive review of a variety of studies with implications for the Office of Education's proposed developmental study, and with the development of data pools of particular use to such a study. The steps involved in this phase were as follows:

1. Selection of the studies: The opinions of a broad-based panel of experts were obtained to help identify major, relevant longitudinal studies. Studies selected for review were:

Astin, A.W. "Differential College Effects on the Motivation of Talented Students to Obtain the Ph.D." Journal of Educational Psychology, 1963, 54, pp. 63-71.

Astin, A.W. & Panos, R. The Educational and Vocational Development of College Students. Washington, D.C.: American Council on Education, 1969.

Bachman, J. et al. Youth in Transition. Vol. 1. Ann Arbor: University of Michigan, 1967.

Bachman, J. et al. Youth in Transition. Vol. 2. Ann Arbor: University of Michigan, 1970.

Coleman, J.S. et al. Equality of Educational Opportunity. Department of Health, Education, and Welfare, Office of Education, Washington, D.C.: Government Printing Office, 1966.

Hilton, Thomas L., A Study of Intellectual Growth and Vocational Development, U.S. Department of Health, Education and Welfare, Office of Education, Bureau of Research, Final Report, Project No. 6-1830, March, 1971.

Husen, T. (Ed.) International Study of Achievement in Mathematics. New York: John Wiley, 1969.

Kagan, J. & Moss, H. Birth to Maturity: A Study in Psychological Development. New York: John Wiley, 1962.

Katz, J. et al. No Time for Youth. San Francisco: Jossey Bass, 1968.

Lehmann, I.J. & Dressel, P.L. Changes in Critical Thinking: Ability, Attitudes, and Values Associated with College Attendance. East Lansing, Michigan: Michigan State University, 1963.

MacFarlane, Jean W., Studies in Child Guidance, Monographs of the Society for Research in Child Development, National Research Council, Washington, D.C., 1938.

Newcomb, T.M. et al. Persistance and Change: Bennington College and Its Students After 25 Years. New York: John Wiley, 1967.

*Shaycoft, M. Project Talent-The High School Years: Growth in Cognitive Skills. (Interim Report 3 to the U.S. Office of Education, Cooperative Research Project No. 3051) Pittsburgh: Project TALENT Office, American Institutes of Research, 1967.

Super, D.E. et al. Career Pattern Study: Monograph IV. New York: Columbia University, 1967.

Thistlethwaite, D.L. Effects of College Upon Student Aspirations. (U.S. Office of Education, Cooperative Research Project No. 0-098) Nashville, Tennessee: Vanderbilt University, 1965.

Tillery, D. et al. Project Scope--School to College: Opportunities For Post-secondary Education. Berkeley: Center for Research and Development in Higher Education, University of California, in preparation.

Trent, J.W. & Medsker, L.L. Beyond High School. San Francisco: Jossey Bass, 1968.

* Project Talent, under the general direction of John Flanagan of the American Institutes of Research, has produced an impressive bibliography of publications among which the Shaycoft study cited here is representative.

In addition to the major studies cited above, the following additional research reports were reviewed.

Bayley, Nancy, "Constancy and Variability of Mental Functions of Intelligence From Birth to 18 Years," *Journal of Genetic Psychology*. The Journal Press, 1949.

Bayley, Nancy, "Learning in Adulthood: The Role of Intelligence," *Analysis of Conceptual Learning* (Harris, ed.), Academic Press, Inc., 1966.

Flanagan, John C., *et al*. *Project Talent, Studies of the American High School*, Monograph No. 2, University of Pittsburgh, 1962.

*ibid*., *Project Talent, The American High School Student*, Final Report No. 635, U.S. Office of Education, University of Pittsburgh, 1964.

*ibid*., *Project Talent, Five Years After High School*, American Institutes for Research and University of Pittsburgh, 1971.

Honzik, Marjorie; MacFarlane, Jean; and Allen, Lucille, "The Stability of Mental Test Performance Between 2 and 18 Years," *Journal of Experimental Education*, 1948.

Honzik, Marjorie, "Developmental Studies of Parent-Child Resemblance in Intelligence," *Child Development*, Society for Research in Child Development, 1957.

*ibid*., "A Sex Difference in the Age of Onset of Parent-Child Resemblance in Intelligence," *Journal of Educational Psychology*, American Psychological Association, 1963.

*ibid*., "Environmental Correlates of Mental Growth: Prediction From the Family Setting at 21 Months," Paper, 1967.

Sherman, Barbara, *Role Exploration in the Decision-Making Process of Adolescents*, New York: College Entrance Examination Board, 1971 (in press).

Tillery, Dale; Sherman, Barbara; Donovan, Denis, "Helpfulness of Parents, School Personnel, and Peers to Students with Different Educational Aspirations," paper presented to the American Psychological Association, San Francisco, August 30, 1968.

Tillery, Dale and associates, working manuscripts of chapters from book to be published.

2. Criteria for analysis: Criteria for describing and evaluating instrumentation methodology and design were developed by the Analytical Review staff, guided by careful consideration of several sources of expertise covering these subject areas (see e.g., Hyman, 1955; Campbell and Stanley, 1963; Anastasi, 1968).

3. Study documentation: A comprehensive, descriptive analysis of each study was conducted to provide an overview of the studies in terms of their objectives, relevance to the proposed Office of Education study, research procedures, and major findings, as indicated in the following section.

What follows in this report corresponds with the objectives of the project enumerated above, including reports on the abstracting process; issues and objectives of the studies reviewed; research designs; sampling procedures and problems; instruments and measurements; statistical design and procedures; summaries of findings organized by matrices and models; procedures used in implementing the studies; and conclusions and recommendations. Additional materials concern the "User's Guide", a prototypic simulation model to illustrate the application of studies of this kind, and specifications for requests for proposals for developmental, longitudinal research on educational effects.

## I. THE ABSTRACTING PROCESS

Abstracting the studies reviewed in this report into a compact yet meaningful form was a difficult task. The reports of the studies varied in length from one volume of 350 pages to 7 volumes of approximately 400 pages each. Studies collected records on subjects from a minimum of 3 years to a maximum of 40 years. Not only was the amount of material that had to be reviewed immense but often the presentation of the reports were disorganized and difficult to follow. Early attempts to produce abstracts resulted in versions which were insufficient to allow the reader to grasp adequately the essence of the reports. Therefore, a standard format was developed which incorporated essential elements included in, or which should be included in, reports of empirical investigations of the kind under consideration.

The decision to adopt a standard format required much additional time both for developing the criteria and format for the abstract and assimilating and conceptualizing the many volumes of studies in order to cast the material into the new format. This additional time and effort was necessary for both precision and clarity and additional benefits soon became apparent.

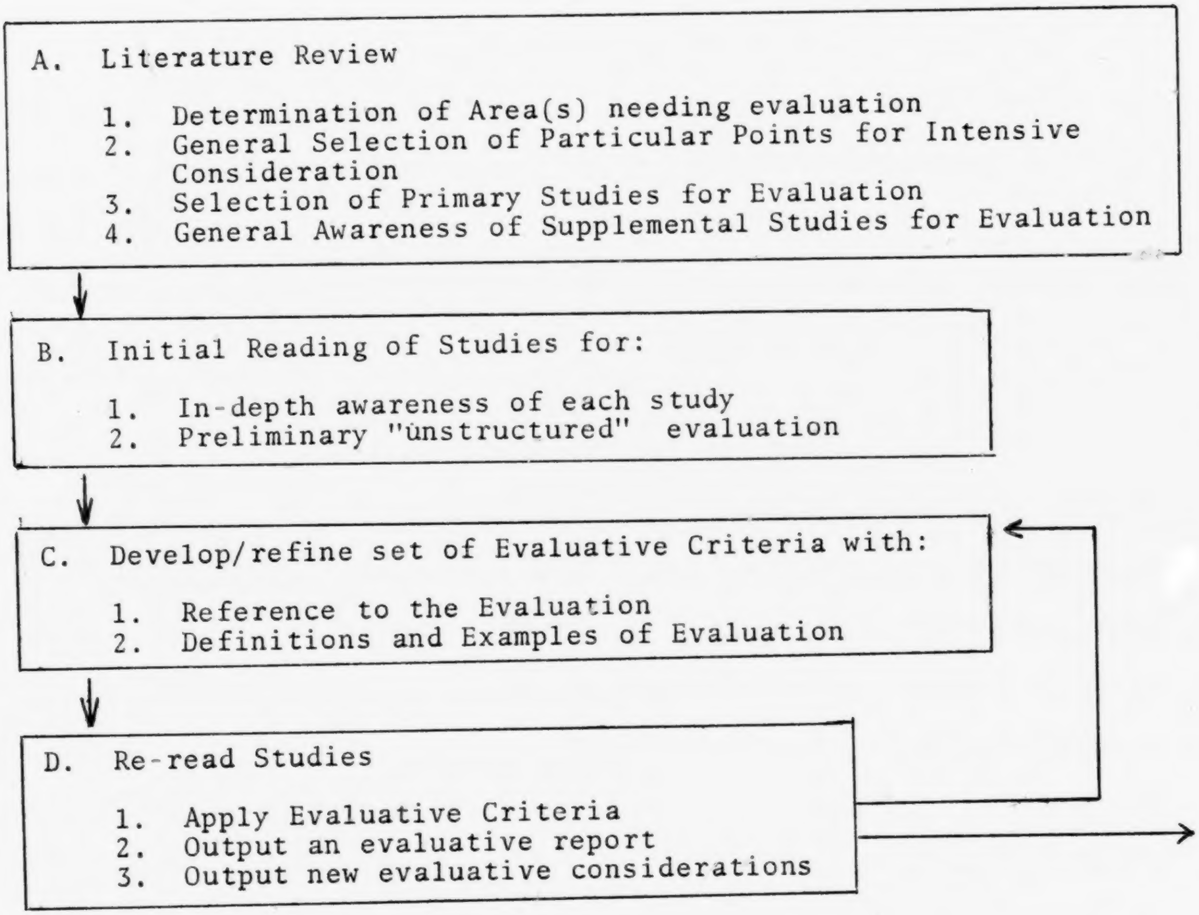
The process of producing a compact and yet comprehensive abstract, revealed that the investigators' reports often contained a number of deficiencies, for example, inadequate mention of the instruments used, lack of operational definitions of the variables being investigated, and incomplete descriptions of the sample.

The use of a standardized format pointed out these "area" deficiencies. The thrust towards compactness also required shearing away unnecessary verbiage, which often indicated that the authors had lost their point during long rambling statements.

The standardized format also facilitated comparisons among the studies. For example, in the "Instruments and Measurement" section, operational definitions of the variables measured by the instrument are enumerated. In some cases, where operational definitions were not supplied by the researchers, or were not clear, the staff selected for examination, items from the instruments used in the studies which appeared most suggestive of the nature of the variable. This made it possible to isolate instances where several researchers investigated the same variable or concept but defined them or measured them in different ways.

For example, socioeconomic status was a major variable under consideration in several studies. Trent and Medsker measured socioeconomic status (SES) by father's occupational level. Bachman, on the other hand, measured SES by a composite index including father's occupational level, educational level, mother's educational level, and number of books in the home. Attention to these differences made it possible to examine some of the data in terms of the multi-method, multi-trait process described by Campbell and Fiske (discussed later in this report), and to detect sources of differing conclusions. Thus, a major benefit of the abstracting or summarizing process was the increased ability to detect errors or oversights in the reports themselves.

The abstracting process was an evolving one. That is, as work proceeded on the abstract model, conceptualization changed, expanding to require more information. For this reason, it was necessary to return repeatedly to the research reports to obtain this additional information. The additional time spent on the abstracting process precluded casting all of the studies into the comprehensive format as desired. In fact, even after several of the abstracts had been completed in what was considered final form, improvements on the model were made. The abstracts included in the Appendix, then, represent what were perceived as proscribed abstracts at the time of their completion. The model for abstracting included at the end of this section represents the project's latest conceptualization, thus illustrating the evolving process of this phase of the analytic review. An important "spin off" of this review of longitudinal studies has been the emergence of a model for evaluating research which serves concomitantly as a process for evaluating studies and for refining criteria used in the evaluation process. The model is diagramed below.


A. Literature Review
1. Determination of Area(s) needing evaluation
2. General Selection of Particular Points for Intensive Consideration
3. Selection of Primary Studies for Evaluation
4. General Awareness of Supplemental Studies for Evaluation
B. Initial Reading of Studies for:
1. In-depth awareness of each study
2. Preliminary "unstructured" evaluation
C. Develop/refine set of Evaluative Criteria with:
1. Reference to the Evaluation
2. Definitions and Examples of Evaluation
D. Re-read Studies
1. Apply Evaluative Criteria
2. Output an evaluative report
3. Output new evaluative considerations

It may well be that the areas of greatest scientific advance are characterized by very clear and explicit reporting standards as well as clear and explicit research methodologies, neither of which can be generally ascribed to educational research. Howard Kendler, Professor of Psychology, University of California, Santa Barbara, remarked that psychological theories are not disproven; they just die away for lack of proponents. Extending Kendler's observation, perhaps theories die away because readers cannot comprehend the reports and thus, cannot become proponents. In an era of increased information overload, clarity and compactness are essential.

In anticipation of the Review's summary and recommendations, the suggestion here is that considerably more attention be given than is customary to the organization of research reports. For this reason, the following section will present a comprehensive description of the elements of the abstract proposed as essential in every research report.

## A. Critical Elements of the Abstracts

It goes without saying that one must include the title, author, publisher and publication date. Ten additional categories of information have been identified, each of which will be discussed in turn: major issues, major objectives, major hypotheses, design, description of the sample, variables studied, instruments and measurement, statistical procedures, major findings, and conclusions, recommendations or implications. An eleventh component, critique of the study was added after the initial phase of the abstracting process was completed and is not available therefore for all of the studies.

Each of the above named components will be discussed in detail below. It should be kept in mind, however, that the discussion about these elements as essential components of a good abstract also applies to a research report. Each of these components are critical to scientific reporting and as mentioned, were not always adequately treated in the studies reviewed.

1. Major Issues:

It is always important for the professional scientist-reader as well as for the lay reader to have a conceptual framework in which the study relates in order to place the study in perspective and to understand and comprehend the organization and procedures of the study in context. Providing the reader with a general description of the content and/or rationale for conducting the study, including comments on the historical status of the area, previous related studies (if any), or a discussion of the emerging need to collect data in an heretofore uninvestigated area, provides a context for the reader. For example, commenting on the uneven distribution of talent, research funds, and other resources among colleges and universities, Astin (1968) states:

> While these facts suggest that college environments differ greatly in their quality and character, administrators, faculty, students, and others concerned with such institutional differences are handicapped by the dearth of accurate comparative data....For the most part, meaningful information about the intellectual and social climate of the institution is missing...(p. 1).

This study is describing, as its rationale, the emerging awareness and need for new types of data. The basic rationale for the Kagan and Moss (1962) study was the recognition that much of the existing data about the process and stages of development, resting as it did basically on retrospective impressions, needed to be verified by a longitudinal study of the same individuals over a number of years. Specifically, Kagan and Moss state:

> There has always been, however, an explicit and rather dogmatic conviction that selected adult motives, attitudes, and behaviors begin their growth during the first 10 years of life... Retrospective impressions of childhood gathered from psychotherapy sessions, anecdotal reports, and private introspections support this belief, but more substantial evidence has been difficult to obtain. Only systematic longitudinal observations can discover those behaviors that are marked for future use and those that will be lost along the way (p. 1).

Generally the studies under review were quite clear about the issues underlying their research. They touched on critical topics and raised many questions and implications concerning the functions of education and the assessment of these functions. Some of the major issues and related questions are treated in Part III of this research report.

## 2. Objectives of the Study:

This component differs only in degree of specificity from that of "Issues". The emphasis here is on specifying with a greater degree of precision, the intended domain of inquiry. Usually, the "major issues" or problems described are too vast and too global to be examined by one study. Moreover, because global statements provide no specific indicator for determining whether or not the objective has been attained, they are often open to multiple interpretation. Although, of course, the relationships of the objectives of the study to the larger domain described in the "Issues" section should be made clear, some focusing of the scope of the study is essential.

The evidence indicates that generally this is a very good component of the research reports reviewed for this project. In most cases, the objectives of the study are well stated; sometimes, however, they are stated too generally. For example, Astin (1968, p. 1) states: "The study reported here is concerned with describing and measuring some of the important differences among the environments of undergraduate institutions." While Astin did define what some of these differences are in later pages, the objective itself is loosely stated and ambiguous. Thistlethwaite (1965, p. 19) was relatively precise at the outset in stating that:

> Our objectives in undertaking this research were to identify types of college environments which facilitate or impede the undergraduate's motivation for advanced training and to formulate steps which college administrators and faculties might take to encourage more of their talented students to seek graduate or professional training.

An explicit statement of specific objectives, in addition to a more general objective, is crucial for several reasons. First, explicit objectives increase the clarity with which the intents of the study can be communicated. Thus the reader can more easily place the study in a contextual framework. Morever, by stating the research objectives in measurable terms, that is, what the study is trying to do or will accomplish, the reader, and the researcher himself, are provided criteria or standards against which the study can be evaluated. To put it simply, only when we know precisely what the researcher was trying to do can we determine if he, in fact, did do it.

Researchers, however, rarely evaluate their own work in this context, yet often they make decisions regarding their future research based on the results of their previous unevaluated investigations. Frequently, researchers review the procedures, the design and methodology in order to make refinements in their strategies for replication, but without some "yardstick" against which these assessments can be measured, defensible decisions regarding future research cannot be made.

A statement of specific objectives increases the likelihood that the authors will organize their findings around the stated purposes of their research. Not only do explicit objectives force the researcher to describe concretely the criteria included in the research design, but they allow the researcher and the reader to recognize potentially relevant outcomes that have been excluded by the design, or at least have not been directly dealt with in a particular study or research program.

Educational scientists and potential users of the findings of any research study that has implications for educational practice in schools, colleges and universities must scrutinize not only the research design and methodology that led to the findings, but they also should determine the relevance of the outcomes, as defined in the research, to educational practice. By carefully stating the purposes of the study, the investigator, the consumers, and interested readers can evaluate not only the purposes of the study but the effectiveness of the study in attaining its objectives, a process researchers at present seem reluctant to engage in.

For the purposes of the present report, efforts have been made to derive rational statements of objectives, post hoc, for the few studies reviewed herein where the researchers did not initially clarify the intentions of their investigations.

3. Major Hypotheses:

One of the first important steps in designing a study is the process of formulating incisive hypotheses or research (and researchable) questions. Without performing this first step adequately, the remainder of the study will be limited. Poor organization hinders thorough evaluation and often allows an author to make spurious recommendations.

Not all studies have *a priori* hypotheses, but in most cases, even in exploratory studies, it is possible to articulate the guidelines for the selection of data to be collected. In only a few instances was the literature remiss in this respect. Sometimes, however, descriptions of hypotheses were lacking where it was apparent that hypotheses were being tested. For example, although not specified as hypotheses, Kagan and Moss (1968,pp. 140 and 210) state:

> As anticipated, the noncompetitive adult men were fearful and avoided dangerous activities during childhood..., It was anticipated that maternal education might be consistently related to acceleratory behavior, but this relationship was minimal for Period III and not consistent for Periods I and II.

It may well be, however, that publishing the findings of a research study in a book that may be read by many non-professional persons alters the level of scientific reporting that is used by the author. That is understandable and may explain the lack of hypotheses stated in Kagan and Moss. However, for the sake of professionals who are also interested in the results of the study, a more clear statement of the research hypotheses should be included.

In some cases, authors did admirable jobs of organizing their hypotheses and findings, e.g., Lehmann and Dressel; Trent and Medsker, 1968; and Husen, 1969--the latter two studies which were published in books for general circulation. Husen devotes a whole chapter to a discussion of the hypothesis formulation procedures carried out in his study.

In other cases, the authors posed questions, rather than hypotheses. For example, Hilton raises a series of questions to explicate five out of his nine major objectives. In discussing "additional" purposes of their study Bachman and associates (p. 17) raise such leading, global questions as: "What administrative arrangements, policies, and practices produce a truly developmental or a stunting environment for the student? What organizational and sociological facts create the interpersonal situation of teaching and learning which the student encounters directly?"

While some criticism may be directed to those studies which lacked even the organization provided by questions, new lines of inquiry and new hypotheses may be discovered in the process of data analysis and during on-going research efforts and this is to be encouraged. An example of this is provided by MacFarlane (1938 p. 125) who commented in a report of the extensive Berkeley growth studies that: "As the study and children grew, new "hunches" and questions arose which led to an expansion of our criteria and to a corresponding expansion of "basic" facts to be sought."

It is important that reports be organized either around hypotheses or questions and well organized reports should highlight their problems and deficiencies, as well as their advantages. As the desire for mathematical rigor stimulated much research and criticism related to Clark Hull's Learning Theory, a desire for educational rigor should stimulate critical research reporting and appraisal.

The format for the abstracts provided some additional organization, particularly through the conceptual topics utilized in the models to be discussed subsequently. The process of organizing hypotheses, and later findings, around the conceptual topics used in the model, facilitated the development of the models and aided in the more accurate determination of the areas of inquiry not covered by the reports.

### 4. Research Design:

Although all of the components described in this section of the report are important, some are vital, and the research design is perhaps the most vital of all. One's ability to ask and answer questions about the data are severely limited by the boundaries of the design. Frequently, one can make "adjustments" by the appropriate use of statistical procedures, such as covariance analysis, or by weighting the sample to correspond more to the characteristics of the population, but if control groups are omitted or non-respondents not followed-up, severe restrictions are placed on the generalizability of the findings and inferences that can be made from the findings, regardless of the "adjustments" incorporated.

The design of the study is one aspect of the procedure that operationalizes the testing of the questions and hypotheses. The design is so important and yet so difficult an area to evaluate that a major portion of this report is devoted to the topic. Only a brief description of the essential elements of research design will be presented here. These elements include:

a. The type of design: The research report should make clear the distinction between historical, exploratory, and explanatory designs and indicate which of these titles is applicable to the study. In addition, the distinction between longitudinal and cross-sectional studies should be made along with specification of the time span of the entire study. A table from Project Talent* illustrates:

| Grade When Tested in 1960 | Years for Follow-up Studies | | | |
|---|---|---|---|---|
| | 1-Year Follow-up | 5-Year Follow-up | 10-Year Follow-up | 20-Year Follow-up |
| 12 | 1961 | 1965 | 1970 | 1980 |
| 11 | 1962 | 1966 | 1971 | 1981 |
| 10 | 1963 | 1967 | 1972 | 1982 |
| 9 | 1964 | 1968 | 1973 | 1983 |

b. Description of the groups to be compared: Analysis groups to be investigated should be clearly explained and justified, together with the rationale and procedures for sampling the populations represented by the groups. (A more extensive description of the sampling problems and procedures will be discussed in a later section of this report).

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* Source: Flanagan, *et al*. (1971), p. 1-2.

c. Data: A description of the kinds of data to be collected, by whom and how frequently should be included in this section as well as a description of the methods for obtaining data on non-respondents. Where research designs have been subsequently altered, either modified or enlarged upon, as in the case of longitudinal studies spanning many years, such modifications and their consequences should be noted along with a rationale for the modifications in the subsequent or final reports.

5. Description of the Sample:

Whereas a description of the design informs the reader about the extent to which the hypotheses under investigation were adequately tested, a precise description of the sample allows the reader to determine the adequacy of generalizing the findings from the sample to the population. It is important, then, for this component to include each of the following elements.

a. A description of the population: Although for statistical purposes a population may be defined as the complete set of objects (people, animals, etc.) having one or more common characteristics in which the investigator is interested, a more expanded definition is needed for research reporting. For example, if the researcher states that his population consists of all tenth grade high school students in the United States in 1962, we know clearly who is being investigated. However, high school students have thousands of characteristics and no one could study them all at once. Therefore, the reviewer must know what is being studied, such as intelligence test scores, health, attitudes, or specified behaviors.

It is important then that the investigator specify the particular characteristics of the population in which he is interested, and indicate how he is tapping these variables and/or which of them he is using as a basis for stratifying his sample.

b. A description of the sample: This should include data on important parameters, such as sex, racial and religious composition and any special characteristics of the sample being investigated in the study.

c. A description of the sampling procedure: To generalize from the sample to the population, the sample must be representative of the entire population, free of systematic biases. There are several acceptable ways of obtaining such a sample, with the most ideal methods incorporating a random selection of the sample's subjects. In some cases, of course, it is extremely difficult to use precise methods for the random selection of the sample. The investigator, however, should report his method of selection so that the reader may determine if the statistical requirements of randomness have been met, and the limitations and consequences when they cannot be met.

Even when random methods of selection have been used, it is possible that there will be differences between different samples drawn from the same population. This sampling fluctuation is to be expected since different samples contain different portions of the total populations; a second sample will not have exactly the same characteristics and thus the same data as the first sample.

Sampling fluctuation, however, decreases as the size of the sample increases. For this reason, it is important that the investigator specifiy the exact number of subjects in the sample and the exact number of subjects possessing particular characteristics critical to the research (e.g., the number of females and number of males where inferences are to be drawn about sex-linked variables). Kagan and Moss indicate that if the data for males and females in their study had been pooled, many of the relationships they found between child and adult behavior would have been negligible since the positive correlation for one sex would have been cancelled by the zero order relationship for the other.

d. *Methods used to verify the sample representativeness, and limitations of the study due to sampling biases*.

Few studies met the requirements of this section. Particularly noticeable was the failure of investigators to report methods used for verifying the representativeness of their sample. In several cases, the authors made outright pleas for the reader to accept the data on their word. Sampling biases, especially from large non-respondent rates, seem to be the norm in this type of educational research.

It is the responsibility of each investigator to state candidly the problems encountered in the sampling procedure, the lack of representativeness or the presence of biases, if any. Moreover, researchers have an obligation to caution the reader in the use of potentially or actually biased data, particularly in the generalization of the findings to the population or to other groups. This obligation is especially important when the research bears upon policy formation and practices to be implemented in the schools.

6. Variables Studied:

It is extremely useful to the reader to have displayed in an accessible, forthright form, the range of variables studied. Again, the problems of organization in the research became apparent since, in several instances, the reader was forced to peruse the entire research report in order to ascertain the complete set of variables being investigated.

For purposes of the Review, the studies' variables were assembled in accordance with the conceptual categories used in the models designed to assess the import of the variables. But, as a matter of principle, clear presentation of the variables assists the reader in understanding the manner in which the researchers conceptualize their studies and in evaluating the findings based on the variables in this framework.

As noted previously in the introduction to this section and also in the next section, Instruments and Measurements, it became clear that operational definitions of the variables were essential. Without such definitions, the variables may be open to interpretation, and thus the findings of the research may be misleading. This is true particularly when they are examined for their contribution to a synthesis of findings from several studies.

7. Instruments and Measurement:

The research design was described as one aspect of the procedure that operationalizes the testing of hypotheses and questions. The instrumentation or measurement process is another step.

As mentioned earlier, an important portion of the project's descriptive process was to determine the relationship between the concept (variable) and its operational definition (measurement process and instrument), particularly because we had noted that there were several instances in which the same concept was measured differently, potentially altering the meaning of the finding. Therefore, we included along with each instrument, the variable that the instrument was designed to measure, and an operational definition of the variable as used in the particular study.

In some cases, we seem to have paid more attention to the relationship between the variable and the instrument than did the authors. Yet the development and use of appropriate measurements and instruments is crucial to the outcome of the study. No matter how well the author conceptualized the variables to be investigated or how good a research design he chose, meaningful relationships cannot be determined without selecting or developing and validating adequate measurement instruments or techniques.

Although there is a separate section dealing with instruments and measurement, a brief description of the critical elements of instrumentation we feel should be reported by investigators is presented here.

a. Reliability: Perhaps the most basic data concerning instrumentation which should be presented in the research report is that concerning the reliability of the instrument. This is particularly true where questionnaires have been specially developed for the research study. We suggest that three types of reliability information be presented.

(1) Test-retest reliability: This information is useful in assessing a measure's long-range stability.

(2) Internal consistency reliability: This information is needed in order to determine how coherently the test items assess some dimension of behavior.

(3) Alternate-form reliability or matrix sampling reliability: Where item sampling has been employed in the form of alternate forms of a questionnaire, it is important that reliability information be presented.

b. Replicability: It is important to report the replicability of procedures used to obtain the normed scores. Sometimes this information is not presented in the research report itself but rather in a technical manual. If this is the case, the information presented should be simple and specific. If the procedures described are complicated, non-specific, or based upon abnormal samples, the test will not be replicable and is clearly less useful for the educator.

A review of the instruments used in the studies made it apparent that much duplication of effort took place. Several of the investigators developed special questionnaires and instruments designed to measure variables when suitable instruments designed to measure these same variables were already in existence.

Researchers should supply the data necessary concerning both the replicability of their instruments and the range of coverage of the instruments so that other researchers may make use of validated instruments wherever possible. Such sharing would reduce costs, not only in terms of money, but in terms of time and manpower.

8. Statistical Design:

This section includes descriptions of the types of statistical procedures employed to summarize and interpret the data. For the purposes of the abstract, we reported the techniques used and occasionally some observations about certain procedures not used or apparent limitations of the procedures used. Special statistical procedures that were developed particularly for the research at hand, as in the case of Bachman's Multiple Classification Analysis, (MCA) have been described in detail. Otherwise, extensive comments regarding statistical procedures have been reserved for a special section of this report.

9. Summary of Findings:

The conceptual organization around four models described in the hypothesis section was also used in reporting the findings. The numbers and letters used to identify the findings correspond to the numbers and letters of the hypotheses, thus facilitating comparisons between the various reports and the models and comparisons between the hypotheses and the findings of each individual report. Where possible, particular hypotheses confirmed or rejected are indicated, and the corresponding numbers of the hypotheses and findings within the abstract facilitates cross-reference for the reader.

In some cases, where research designs permitted, the data were examined from vantage points other than the models. For example, in those studies which sought specifically to relate independent and dependent variables, the findings were organized according to one or both sets of variables. To illustrate, Husen's study sought to isolate the factors associated with (1) level of mathematics achievement and (2) interest or motivation in mathematics. Accordingly, the findings are presented as they relate to prediction of each of these dependent variables.

Many of the studies, however, did not explicitly discuss their design in terms of independent and dependent variables, despite the fact that the study was so organized. Some studies, such as Kagan and Moss', examined a variable at one period and correlated it with observations on the same variable, or a closely related one, at a later time. Since the purpose of the Kagan and Moss study was to show the relationship between child and adult behaviors, presentation of the findings in this manner was meaningful and appropriate to the objectives of the study.

In spite of the fairly explicit guidelines that had been established for the abstract, development of the synthesis of findings was extremely difficult. One major difficulty was the determination of what was a major finding since it was clear that it was both impossible and of marginal utility to report all of the findings presented in the studies. Moreover, the absence of any decision rules established by the authors as guides in the reporting of their findings was noticeable. The custom of reporting findings where statistical significance has been established is common for most of the studies reviewed. This decision rule, however, only establishes the level at which the researcher is willing to accept the finding as reliable, at times without due respect for the limitations of the sample or design.

The meaningfulness or importance of the finding is another matter. For example, there may be a statistically significant difference between the average heights of males and females, but this difference may not be meaningful or important. Meaningfulness must be determined within the context of the variables and relationships under examination.

On the other hand, relatively small differences that are statistically significant may be of prime importance. For example, a path analysis of Project TALENT data by Spaeth and Greeley (1970, p. 157) indicates that intellectual ability has a direct relationship or path of .06 to the level of college seniors' expectations for occupational prestige, a value which appears very low. Only further research, however, can determine what factors affect the magnitude of this relationship.

In other words, significance is a necessary but not a sufficient condition for an obtained difference to be important. A decision rule is in order, then, to provide guidelines for determining the meaningfulness of findings to be presented.

### 10. Conclusions, Implications and Recommendations:

The discussion in the last section regarding the importance of statistically significant findings also bears on the interpretations and conclusions made by the researcher. Interpretation and conclusions based on statistically significant but "meaningless" findings are spurious. Lehmann and Dressel report many significant low-order correlations without determining if they are in fact meaningful.

Perhaps a re-examination of the data is crucial in order to determine if the author's conclusions are justified. For example, Kagan and Moss conclude that "congruence with traditional standards for sex-role characteristics accounts for the differential stability of males and females" (p. 268) and the "individual's desire to mold his overt behavior in concordance with the culture's definition of sex-appropriate responses is a major determinant of the patterns of continuity and discontinuity in his development" (p. 269).

Yet a re-examination of the data reveals an inconsistency in this conclusion. The correlation between passivity during the ages 6 to 10 and adult withdrawal behavior for girls is .48. Since a 7 point rating continuum was used (although not described by the authors), this means that girls with a rating of 6 or 7 on passivity as children were likely to engage in withdrawal behavior as adult women. However, girls who were rated 1 or 2, or non-passive, as children were also likely not to engage in withdrawal behavior as adult women. Kagan and Moss do not show a shift towards passivity and dependence in females nor a shift towards aggression and anger arousal in boys, so the conclusion that individuals "mold" their behavior in accordance with cultural definitions of appropriate sex responses is not supported by the data.

The absence of control groups in many of the studies also casts doubts on the conclusions, particularly with respect to conclusions concerning the impact of college on students. For example, Lehmann and Dressel conclude on the basis of their data that college has an impact on students' critical thinking ability; Newcomb concludes that college has an impact on students' political and social attitudes. Both conclusions may well be correct (especially in light of other research), yet, neither study employed a control group of young people who did not attend college, and in both cases the effects of natural maturation could be a confounding variable.

The crucial ingredient is that of controlling the variables in the population. That is, in a well conducted experimental study, all variables are handled in such a way that measured effects on the subjects' behavior or attitudes can be attributed to the influence of one variable, in this case, the influence of college. The difference in the means of two or more different populations (college versus non-college) makes causative statements possible. Without control groups, causative statements are not justified. Again, the problem of statistical significance is raised, in that the statistical significance of correlation coefficients does not permit causative statements. According to Games and Klare (p. 444), "It is not the statistical analysis that justifies the making of causative statements--it is the presence or absence of control".

The conclusions presented in the abstracts are those of the investigators. An analysis of these conclusions both in light of the findings and statistics are presented in the synthesis of findings sections of this report. The conclusions reached by the project staff are presented in the final chapter of this report.

Although conclusions were contained in the studies reviewed, implications and recommendations were not universally discussed. A discussion of the implications of the findings, particularly those relevant to educational planning and practice would be helpful both to educators and practitioners in the field and to other researchers.

The investigator has presumably been deeply involved in the research study and has the knowledge and experience, above and beyond what he has reported, to deal most efficiently with the implications of his findings. Moreover, proper evaluation of research should include an appraisal of "what it all means".

The investigator is also the person who can most appropriately and should make recommendations based upon his conclusions. Recommendations can range from those advising replication of the study with suggested modifications and revisions of the procedures or methodology to specific recommendations for educational improvements such as those made by Trent and Medsker (pp. 268-269):

> Other possibilities for experimentation... include:
>
> 1) a collaboration of college, high school, elementary school teachers and counseling personnel in special courses and programs at all grade levels;
> 2) the establishment, from the junior year of high school through the sophomore year of college, of "moratorium" intermediate colleges to explore the meaning and achievements of society, and the values, characteristics, occupations, and activities of its members and groups.

Specific recommendations such as the above provide the link between educational research and educational policy and practice. Such a link is crucial for continued educational development and improvement.

11. Model Abstract:

AUTHOR(S):

TITLE:

PUBLISHER AND DATE:

MAJOR ISSUES:

OBJECTIVES OF THE STUDY:

General Objectives

Specific Objectives

MAJOR HYPOTHESES:

Organized according to topics or models

METHODOLOGY:

Purpose: Exploratory, descriptive, or explicative

Type of Data: Historical, naturalistic, laboratory

Type of Design:

a. Pre-experimental, Quasi-experimental, True Experiment

b. Longitudinal (time period stated), cross-sectional

Population:

Sampling procedure: (for institutions and students)

Description of sample: Students

a. Sex

b. Age

c. Racial composition

d. Religious composition

e. Special (e.g. National Merit Scholarship winners; "educationally disadvantaged"; pre-school; creative students)

Description of sample: Schools

a. Level of Institution (e.g. high school; two-year college; four-year college; university)

b. Type of Institutions (e.g. public/private; sectarian/non-sectarian)

c. Geographical location

d. Characteristics of student body (e.g. segregated/non-segregated; coeducational/non-coeducational)

e. Special characteristics (e.g. unique programs; curricular emphasis)

Sample Representativeness (Verification procedures)

Non-respondent Follow-up Procedures

Independent Variables and Measurement Procedures:

a. Operational definitions of the variables

b. Instruments used to measure the variables

Dependent Variables and Measurement Procedures:

a. Operational definitions of the variables

b. Instruments used

Data Analysis Strategies and Statistical Procedures: Conditions for validity:

a. Internal validity: accuracy and confidence of the conclusions

b. Ecological validity: accuracy and confidence of the generalizations to other settings

c. Population validity: accuracy and confidence of generalizations to the experimental and target populations

FINDINGS: (organized according to topics or models corresponding to the hypotheses presented)

CONCLUSIONS AND IMPLICATIONS:

EVALUATION OF THE STUDY:

Limitations

Suggestions or Revisions for Replication

RECOMMENDATIONS :

## B. Typology of the Variables

The nature and comprehensiveness of the Analytical Review project required the development of a conceptual framework broad enough to encompass all, or nearly all, of the studies, their variables and their findings.

Perceived consensus of educational, psychological and sociological literature together with scrutiny of the studies selected for examination suggested the heuristic of a conceptual framework consisting of four models:

1. Cognitive/Intellectual Development
2. Personal Development
3. Vocational Development
4. Educational Development

The models basically represent conceptual guidelines with accompanying graphic illustrations for organizing classes of variables according to previously determined or hypothesized relationships important to the understanding of schools' effects on student development. Although not all of the studies did so explicitly, it is possible to classify all of the variables as independent (or predictor) variables and dependent (or criterion) variables - some of which are interchangeable, depending upon the research objective involved.

Despite the fact that some of the researchers did not conceptualize or describe their data as independent and dependent variables, this structure was imposed upon the data during the abstracting process in order to facilitate the discovery of interrelationships among the studies' findings and the integration of the findings into the four models according to topics found to be particularly relevant to student development. A discussion of the types of variable relationships and data analysis strategies is presented in Volume III, Section I, Part B.

The process and function of the Models as well as the rationale for and development of the variable classifications, including the relationship between the synthesis of findings and the variable classification in terms of the basic models are discussed in detail in Volume IV.

# II. OVERVIEW OF ISSUES

A summary description of selected educational issues and problems encompassed by the studies under review follows. Some general gaps in knowledge are noted with respect to each of these issue and problem areas, including cognitive and non-cognitive development, vocational and educational development, and opportunities for educational development.

## A. Cognitive Development

The acquisition and development of differentiated skills spanning the high school curriculum as well as such general skills as reading comprehension, verbal ability, abstract reasoning, and critical thinking were topics of several studies such as Husen, Lehmann and Dressel, and Shaycoft. Each of these studies focused upon educational experiences and social environments facilitating or inhibiting intellectual growth.

Interest in such topics evolved from a variety of educational needs and issues. Project Talent, a longitudinal study of some 400,000 high school students nation-wide, is a case in point (see Shaycoft). The objectives of the study were the following:

1) to develop an inventory of human resources, or, more specifically, an inventory of the capacities and potentials of the nation's youth;

2) to develop a set of standards for educational and psychological measurement; and

3) to develop a comprehensive counseling procedure for guiding students toward various careers.

Some additional issues are posed and dealt with by Shaycoft. To what extent is cognitive growth during the high school years dependent upon similar growth previous to entry into high school? Is there an underlying order or organization of mental abilities which becomes increasingly evident as development proceeds? Finally, is it possible to distinguish empirically between increments of achievement and development of aptitudes, the former relating to manifested capacity and the latter referring to potential capacity?

Husen, addressing his efforts principally toward assessing the productivity and development of educational systems as agencies in the social and economic development of the world's societies, focused on determining which modes of integrating policy, administration, instruction and selection were most effective towards these ends. For Lehmann and Dressel, the overriding concern was the impact of a particular educational program in implementing such global goals as:

> ... the development of skills in critical thinking and problem solving and the development of such attitudes and values as may be acquired by the understanding of the physical universe, of the methods of science, of social organization and the process of social control, and by a study of man himself (p. 2).

Several other issues might be pursued here. For example, public schools offer courses in civics, social studies and citizenship presumably designed to instruct students in the elements of America's political system. However, studies of citizens' knowledge of the political process, and of the rights and obligations associated with citizenship in a political democracy repeatedly demonstrate what these authors view as an ill-informed and frequently uninvolved electorate. Perhaps it is time that the cognitive development goals of public education be seriously extended toward upgrading the political sophistication of the 19 year-old voter.

An assumption here is that goals of this kind would contribute to educational relevance, an issue of increasing intensity during the past decade. To enhance the relevance of education, investigations of cognitive growth might well probe areas where traditionally required subject matter leads to student skills in these areas and the impact of growth in such subjects upon subsequent course selection and achievement. There are indications outside the longitudinal studies under consideration that a "well-rounded education" is induced less effectively by "forced" exposure to a structured program than by a more diffuse program aimed at inculcating a generalized zest for learning (see for example, Brown, 1967; Schoen, 1963). This possibility is surely worthy of more systematic investigation on a longitudinal basis.

In addition, studies of cognitive development to date have given little attention to (1) the degree to which specific subject material and training objectives may be newly introduced at earlier grade levels; (2) the effects of their presentation; (3) the effects of covering subjects in greater depth versus expanding elective curricula. Finally, there remains a need for continued longitudinal research across grade levels with regard to

(1) the nature of cognitive organization; (2) effects of growth on the patterns of cognitive organization; (3) the effects of patterns of cognitive organization on growth; (4) the stages in cognitive development; and (5) the elaboration of the interrelationships among classroom, family, peer, community, age, sex, psychological factors and cognitive development.

### B. Non-cognitive Development

Changes in personality characteristics, values, and attitudes constituted the central themes of many studies. Newcomb and associates, while documenting attitudinal and value change, placed particular emphasis on the normative and social environments encountered during and after their sample's attendance at Bennington College, exploring the impacts of these environments on those persons whose attitudes, values, and psychological dispositions have changed during the study period. The Bennington study addressed itself primarily to the influence of informal social processes and only incidentally to the direct impact of college educational programs on individual development. In analyzing long-term stability of values and attitudes purportedly nurtured in college, these researchers stressed the impacts of college particularly in terms of its "sense of community" upon students' attitudes, values, and life styles.

A techno-economic system of society rapidly evolving toward more complex forms comprised the conscious starting point for Trent and Medsker's research on high school graduates. Reasoning that an increasingly complex society requires not merely improved technical skills, but also values, attitudes and personalities equipped to manage such complexity, Trent and Medsker raised several important educational issues: (1) how can educational institutions more effectively prepare students with cognitive capabilities and personality structures appropriate to the post-industrial society? (2) what are the educational, vocational, and personality characteristics of those who elect not to enter college, regardless of academic aptitude, compared with college withdrawals and with those who persist in college for four or more years? (3) armed with knowledge of school impacts on the development of different types of students, can counseling programs effectively regulate these impacts so as to maximize personal and career development? The results of the pervasiveness of technocracy and its exact impact on society are not clear. Nor is it clear what kinds of personality development are required to cope best with society's technical complexities. However, the issue remains crucial: education must continue to open doors not merely for cognitive attainment but for exploration of and adaptation to one's own personality and the roles defining one's social existence so that the individual can realize his potential in his complex environment and remain in it.

Katz and associates (1968) are intrigued by the possibilities of identifying strategic aspects of college life which are demonstrated to have significant impacts on personality integration. Examples cited are freshman groups, housing, task-oriented extra-curricular activities uniting men and women students, and counseling programs. Having identified such strategic areas, programmatic innovations which aimed at particular facets of student development, such as occupational and marital choice, could be implemented with ultimate emphasis on individualized approaches. The educational issue is essentially one of adjustive educational policies and programs to deal more effectively with the individual needs and development profiles of individual students.

Lehman and Dressel were concerned with the extent to which a particular college program accomplished its goals with respect to the development of values, attitudes, and personality. But, beyond determining the degree of success in achieving changes in these areas, an understanding of the nature and effects of such changes becomes paramount.

The major stimulus for the development and financing of the Bachman study was provided by the endemic issue of dropouts. A study of growth and determinants thereof in adolescent boys focusing particularly on dimensions of "mental health", self concept, values and attitudes, plans and aspirations, and such behavior as dropping out, rebelliousness, and delinquency would contribute, it was felt, to an understanding of such issues as: (1) the extent to which dropouts are "pushed out" of disturbingly dissatisfying school environments; (2) the nature and degree of dissatisfaction with different kinds of school environments; and (3) the relative importance of school and non-school factors in determining dissatisfaction with school.

Kagan and Moss investigated continuity of behavior and personality from pre-school through early adulthood. Despite an absence of data pertaining to school characteristics and experiences, the authors' research infers the importance of school related experiences, especially during the elementary phase, for adult behavior and personality dispositions. The major issue emerging from this study should be a serious educational concern. That is, selected adult motives, attitudes, and behaviors have their roots in childhood; however, contrary to popular convictions of the past, these behaviors and dispositions are not immutably fixed during infancy and pre-school periods. Rather, the process of identification with and involvement in an expanding repertoire of cultural roles, a process in which the school's function is crucial, constitutes a primary mold in which behavior and personality begin to assume their eventual forms. Thus, the degree to which educational programs are successful in promoting student growth and development during the high school and college years may be heavily dependent upon similar success during the elementary and junior high school periods.

While non-cognitive development has become a favorite topic for research, the expanding base of data has yet to provide a mature theoretical foundation or an unambiguous catalogue of findings. Inadequate "controls" for self-selection into and out of the educational system have deterred confident judgments about the general impacts of education on student development.

Assuming the significance of educational impacts reported in the research, explanations of what kinds of institutional characteristics or programs are responsible for what kinds of positive and negative development and how such influences are manifested remains obscure.

Except in summary fashion, we still know little about the interaction of personal, environmental and institutional factors, matters that are recognized as being particularly important in understanding the impact of schools and colleges on students (see, e.g. Messick, 1970 ; Pace, 1970 ). Moreover, a wide array of non-cognitive variables have been investigated in isolation with minimal success in establishing patterns or organizations of values, attitudes, and personality characteristics that develop in concert. Finally, and perhaps most importantly, presumptions about the significance of non-cognitive growth for human adaptation and creativity have remained incompletely explored. Do certain values, attitudes, and personalities indeed reflect maturity in our modern world? If so, how do complex diversities in social, economic, and political life affect the requirements of maturity?

## C. Vocational and Educational Careers

Bachman and associates raised the important question as to the efficacy of high school planning relative to the vocational development of students. Their inquiry aims toward an empirical verification of long advanced theories stipulating a high correlation between vocational development and high school programs or courses providing information about occupations, vocational guidance and counseling, and job placement.

Project Scope (Sherman, in preparation, and Tillery, et al.) seeks the determinants of differential distributions of high school seniors into college and non-college occupations in "patterns" or "channels" which students establish for themselves through the high school years. These patterns and channels are defined in terms of "choice behavior" and "decisions". Several issues are thus forwarded. Are educational and career paths the results of identifiable patterns of decisions? When do such decisions occur? How tenacious and rational are these decisions? What are the home, school, and community influences on the sequence of choice behavior? In retrospect, how satisfied are graduates with the decisions made by or for them?

Trent and Medsker pursued several themes along these lines. First, the quality of post-high school occupational activities were traced by means of breakdowns on types of colleges attended, types of non-college occupations held, mobility, marriage and unemployment. Second, the attributes of persons distributed in these various categories were analyzed. Third, occupational mobility, vocational expectations and aspirations, and job satisfaction were appraised among both those with no college experience and those with some college experience. Fourth, the impact of work as opposed to college milieu upon personality development was investigated. Each of these research problems suggests a corresponding educational issue: (1) What kind of "benefits" in terms of occupational status, job security, and occupational opportunities can be expected by those obtaining a college degree? (2) Is occupational mobility restricted for those eschewing a college education simply because of inadequate education or are restricted mobility and immediate entrance into the post-high school work both reflections of inherently low motivational and intellectual capabilities? (3) Does college experience improve rationality in career choice and ultimately job satisfaction? (4) Does premature entry into the work world stifle growth in personality areas required for occupational mobility? If so, do work-study-programs directed solely at developing technical skills, neglecting maturational factors, introduce artificial "ceilings" to occupational mobility?

Expanding college enrollments and concomitant demands for augmenting the pool of trained college instructors excited Thistlethwaite's study of factors associated with aspirations to advanced college degrees. The issue of recruitment, of course, has been complicated in recent years by an acute financial squeeze on the nation's colleges, restricting both graduate training programs and job opportunities. An interesting response to this dilemma is to experiment with "half-way" degrees and stepped-up programs which may reduce the costs of expensive, lengthy Ph.D. training programs and increase the proportion of budget expeditures available for recruitment of faculty.

Astin and associates were concerned with differentiation among colleges with respect to predominant social environments and resultant influences on vocational and educational careers. That colleges may often be characterized by types of faculty, students, and cultures has been demonstrated. That high school graduates may be successfully "matched" to "congruent" college environments, thereby facilitating vocational and educational careers, has not been fully explored. Counseling programs may be significantly enhanced by continued efforts in cataloguing college characteristics and in identifying particular match-ups of student characteristics and college environments which prove successful.

In the Career Pattern Study, an outgrowth of a considerable number of years devoted to generating and operationalizing theory related to vocational development, Super and his collaborators have sought to integrate two educational concerns conventionally isolated in research endeavors: personality (self-concept) development and vocational development. Conceptually, the gap is spanned by an interest in how developing self-concepts are implemented in the process of choosing and testing occupational roles. However, researchers have experienced much difficulty in deriving testable hypotheses from inadequately formulated theories of self-concept. Thus the outcomes of Super and associates' ambitious undertaking should be instructive if not wholly successful. However successful, critical issues now exist: Can counseling and vocational guidance services scientifically monitor and direct vocational maturation? Are there demonstrable "stages" in vocational development? If so, can vocational "maturity" be assessed in terms of those stages? To what degree does vocational maturity parallel psychological maturity? How and when does the school mediate these developmental processes? What identifiable groups of students respond positively in their vocational development to school influences? What students are indifferent or actively reject educational influence?

The present economic plight of aerospace engineers and increasingly, of college graduates in general, commands the attention of educational policy makers. While it is true that we presently suffer an economic recession, educators should be aware of growing imbalances in the distribution of professional manpower which are certain to transcend today's financial situation. Too many engineers or a shortage of doctors and paramedical personnel are not simply attributable to laws governing "free" market mechanisms. An educational system which extolls the virtues of college degrees and professional occupations creates an atmosphere which can downgrade the manual and the technical. In this *milieu*, aspirations overreach realities of the market place; career plans become founded more on status than on opportunity. As a result, not only may new graduates be disappointed at their job prospects, or experienced employees laid -off in preference for young, highly educated neophytes commanding lower salaries, but millions of frustrated competitors, both in and out of schools, are faced with searching for new careers, and prolonged unemployment or education.

The Soviet Union with its planned economy has faced the urgency of this problem head on for some time. Attempts to resolve the problem have included mandatory full time employment separating secondary and higher education, examinations, and restricted vocational choice. The applicability of these techniques to our situation is a matter for debate. However, the urgency of this issue will, we believe, continue to intensify throughout this decade, calling for both increased economic planning at the national level, and educational programs consciously designed to meet the requirements of a more rational distribution of manpower. Thus, students of vocational and educational development should begin to fill the economic vacuum evident in their research to date with increased attention to expectations and realism in projecting career opportunities. Moreover, perhaps investigators should withhold the label "mature" applied to high aspirations, ambitious plans, and the earning of advanced degrees pending critical analyses of job opportunities, security, and on-the-job competitiveness.

## D. Educational Opportunities

The Coleman Report (1966) set forth four areas of concern, by way of responding to the Civil Rights Act of 1964 which stressed:

> ...the lack of availability of equal educational opportunities for individuals by reason of race, color, religion, or national origin in public educational institutions at all levels in the United States, its territories and possessions, and the District of Columbia (quoted in Coleman, p. iii).

The four major areas involved (1) the degree of racial and ethnic segregation evident in the public schools; (2) the degree to which public schools vary in offering equal educational opportunities; (3) student performance on standardized achievement tests and (4) relationships between achievement and types of schools attended.

Several related issues are implied by the Coleman Report. Noting that Blacks, Mexican and Puerto Rican minorities tend also to be from lower socioeconomic strata, some portion of lowered educational opportunity standards should be accounted for by factors universal to lower class communities, such as a relatively depressed tax base, inadequate physical structures with associated high maintenance costs, inconvenient locations for middle class teachers and administrators who might otherwise be motivated to work in those communities.

Thus, segregation by social class may be as important an issue as racial segregation, since it both cuts across the racial line and coincides with it. Do lower class whites have access to the same educational opportunities available to middle and upper class whites? How do lower class whites compare to middle and upper class minorities in terms of educational opportunities? Are there significant differences between lower class whites and lower class minorities or between upper-middle class whites and upper-middle class minorities in educational opportunities?

Educational opportunity may be defined along several dimensions: school facilities and curriculum, characteristics of teachers and administrators, student cultures, learning ambience, and visible models of success through education. To what degree are each of these aspects reflected in racial or ethnic segregation? In segregation by social class? What relationships exist between these dimensions of opportunity? Does an upgraded curriculum and faculty stimulate favorable changes in student attitudes toward learning and/or does a negative student culture reduce the potency of such an educational program? Can the composition of student culture be altered substantially through integration of whites and non-whites from similar social class backgrounds? Can learning environments in racially or ethnically segregated schools be favorably altered through integration along class lines, leaving undisturbed racial or ethnic compositions?

Achievement levels have often been employed as indicators in comparing the educational opportunities or effectiveness of different schools. However, in comparing schools where segregation is a factor, the use of standards based on relative standings of students on a single test places undue emphasis on achievement _per se_, consequently neglecting crucial motivational factors. One result is to underestimate educational opportunities and effectiveness of minority schools and to exaggerate, by comparison, these qualities among white suburban schools.

Two additional approaches are indispensable here. The first is to ascertain rates of growth in the achievement areas, either through cross-sectional studies or, preferably, longitudinal designs. Of course, evidence of high growth rates in achievement among schools characterized by high proportions of minority Americans, despite distribution of scores below national averages, would indeed be encouraging. Second, since many areas of achievement involve developmental processes, initial levels of achievement, especially in general verbal skills and other areas demonstrated to influence subsequent learning, should be controlled. Thus differential rates of growth may be expected, and must be empirically acknowledged, given different developmental starting points. That white upper class high school students exhibit higher rates of growth in achievement than do lower class blacks, then, may be less a commentary on the quality of educational opportunities in the high schools than on different levels of overall preparedness for managing high school curriculum.

We have oversimplified the problem, however, with the intention of highlighting the importance of matching achievement standards to realistic expectations. In fact, the minority school with its relatively lower growth rate, but one which exceeds expectations, may be more effective in its teaching-learning function than the white upperclass school whose relatively high growth rate was not consistent with expectations.

In arguing for developmental rather than simply relative standards of achievement, however, we are not advocating acceptance of the status quo. Rather we are suggesting, as many others have, that (1) attitudes, values and perceptions formed prior to school entry greatly affect achievement after entry; (2) achievement is a developmental process with its locus probably in elementary schools, or at least prior to secondary school; (3) achievement is not to be measured only by academic performance but by personality and social growth and development as well; and (4) achievement is not merely the culmination of educational opportunities, but the interaction of opportunities, appropriate motivation, and nurturing learning environments centered in large part outside of the traditional boundaries of the educational system.

Shaycoft attempted to introduce both rate of growth and controls for initial levels into their achievement scores. However, their efforts are disappointingly frustrated by inadequate data with respect to the characteristics of students and of schools. Certainly it is pertinent to establish variation among schools in effectiveness, employing sophisticated standards of achievement. However, this can only be a launching pad for investigating what kinds of students develop best in what kinds of learning situations and what kinds of school structures best facilitate an optimum blend of the former two ingredients.

Husen did contribute to an understanding of systemic influences on achievement, but relied on relative achievement scores obtained from a single testing. Educational researchers in the United States might profit from the experience of Husen and his colleagues by expanding their attention from individual school differences to systems differences. In spite of a broadly homogeneous educational system, a closer look at American education probably will reveal rich sources of differentiation along organizational, policy, and curriculum dimensions. In addition, these systematic lines of differentiation extend beyond the school gates into the types of communities supporting the various educational systems. Certainly, with decentralization and community control rapidly emerging as immediate educational issues, research on a diversity of educational systems, their effectiveness in reaching various types of student populations, and the impact of closer community cooperation with or surveillance of local schools will be required by planners and decision-makers.

AUTHOR: Alexander W. Astin

TITLE: "Differential College Effects on the Motivation of Talented Students to Obtain the Ph.D."*

PUBLISHER: Journal of Educational Psychology, Volume 54, Number 1, pp. 63-71, 1963

MAJOR ISSUES:

The increasing needs of education beyond the baccalaureate degree suggests the desirability of identifying differential college effects on students' motivation to seek the Ph.D. degree.

OBJECTIVES OF THE STUDY:

General Objective:

To compare the effects of different college characteristics on students' motivation to obtain the Ph.D. degree.

Specific Objectives:

1. To identify students' aspiration level in 1961.
2. To control student input variables, and then relate student aspiration level to college environment characteristics.

MAJOR HYPOTHESES: No *a priori* hypotheses were given.

INSTRUMENTS AND MEASUREMENT:

1. Special questionnaires prepared by staff (sent out in 1957 and 1961) designed to determine:
    a. Student aspiration level (Level of Aspiration) (e.g., desire to obtain Ph.D. or no desire to obtain Ph.D.)
    b. Sex
    c. Major field of study

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* This abstract was based on a journal article, not the original report. Data not reported in the abstract were not covered in the article.

d. Career choice

e. Degree of satisfaction with career choice (e.g., very satisfied or some other degree of satisfaction)

f. Verbal Aptitude (e.g., score on National Merit Scholarship Qualifying Test)

g. Mathematical Aptitude (e.g., score on National Merit Scholarship Qualifying Test)

h. High school percentile rank

i. High school curriculum (e.g., academic, commercial, etc.)

j. Number of high school mathematical courses taken

k. Number of scholarships applied for

l. Number of scholarships received

m. Distance from home to college

n. Commuter versus resident status

o. Father's educational level

p. Mother's educational level

q. Father's attitude toward students attending college (e.g., 4 point scale from "Insists" to "Doesn't want me to go")

r. Mother's attitude toward students attending college (same scale as Father's)

s. Number of books in the home

t. Percentage of high school peers attending college

u. Father's occupation

2. The eight scales from the Environmental Assessment Technique plus scores on three other factors (identified in a previous study in which 33 college variables were analyzed) designed to measure college variables including:

a. Affluence

b. Size

c. Masculinity

- d. Private versus public control
- e. Homogeneity
- f. Realistic orientation
- g. Intellectual orientation
- h. Social orientation
- i. Conventional orientation
- j. Enterprising orientation
- k. Artistic orientation

VARIABLES STUDIED:

1. Student Variables
    - a. Student aspiration level (LOA) (e.g., desire to obtain Ph.D. or no desire to obtain Ph.D.)
    - b. Sex
    - c. Major field of study
    - d. Career choice
    - e. Degree of satisfaction with career choice (e.g., very satisfied or some other degree of satisfaction)
    - f. Verbal Aptitude (e.g., score on National Merit Scholarship Qualifying Test)
    - g. Mathematical Aptitude (e.g., score on National Merit Scholarship Qualifying Test)
    - h. High school percentile rank
    - i. High school curriculum (e.g., academic, commercial, etc.)
    - j. Number of high school mathematical courses taken
    - k. Number of scholarships applied for
    - l. Number of scholarships received
    - m. Distance from home to college
    - n. Commuter versus resident status

2. Environmental Variables - Family
    a. Father's educational level
    b. Mother's educational level
    c. Father's attitude toward students attending college (e.g., 4 point scale from "Insists" to "Doesn't want to go")
    d. Mother's attitude toward students attending college (same scale as Father's)
    e. Number of books in the home
    f. Percentage of high school peers attending college
    g. Father's occupation
3. Environmental Variables - School
    a. Affluence
    b. Size
    c. Masculinity
    d. Private versus public control
    e. Homogeneity
    f. Realistic orientation
    g. Intellectual orientation
    h. Social orientation
    i. Conventional orientation
    j. Enterprising orientation
    k. Artistic orientation

DESIGN OF STUDY:

Longitudinal--four-year period, retesting after four years, cross-validation on a comparable sample.

DESCRIPTION OF SAMPLE:

1. Population: not specified, possibly all students who took the National Merit Scholarship Qualifying Test in 1957

2. Sampling procedure:
    a. Total sample
        (1) Students: not clear; possibly all Merit Finalists and those who received the Letter of Commendation
        (2) Institutions: not specified; apparently those participating in the National Merit Scholarship Testing Program
    b. Cross-validation:
        (1) Students: those enrolled in institutions attended by a minimum of 15 students from the total sample; if more than 25 students were enrolled, the 25 were selected randomly
        (2) Institutions: those participating in the total sample and with 15 or more students from the total sample
3. Size of sample:
    a. Total sample
        (1) Students: 6,544 (80% of those responding to the questionnaire in 1957; 78% responding to the follow-up in 1961; thus, overall response was 62%)
        (2) Institutions: the 82 institutions participating in the Testing Program which had 15 or more Merit Scholarship students
    b. Cross-validation:
        (1) Students: 1,098
        (2) Institutions: 82
4. Sex: 4,374 males; 2,170 females
5. Racial composition: not given
6. Religious composition: not given

STATISTICAL PROCEDURES:

A special procedure "analogous to the analysis of covariance" which attempts to "correct for" student input differences was used. The procedure involves constructing an actuarial table predicting Ph.D. aspirations based upon student characteristics, then noting the differences by institution from the predicted frequencies.

MAJOR FINDINGS:

I. Educational Development

A. The strongest predictors of subsequent Ph.D. aspirations were the students' initial level of aspiration, sex, and career choice.

B. When level of aspiration, sex and career choice were controlled, the student's degree of satisfaction with his vocational choice, his major field, his verbal aptitude, whether or not he holds a scholarship, and Father's level of education were related to subsequent Ph.D. aspiration in some subgroups.

C. The highest rate of Ph.D. aspiration (76%) in 1961 was found in a cell consisting of 176 males who initially aspired to the Ph.D. in 1957, wanted to be either a scientific researcher or college teacher, were very satisfied with their career choice and whose fathers were college graduates.

D. The cell with the lowest rate (8%) of Ph.D. aspirations consisted of 34 females who initially aspired to a Bachelors degree, had chosen a career other than scientific research or college teaching, had relatively low verbal aptitude and did not hold a scholarship.

E. Four of the 12 college variables appeared to have significant effects on the students' Ph.D. aspiration:

1. Size, percentage of males and conventional orientation tend to have a negative effect on Ph.D. aspiration, that is, expected percentages of Ph.D. aspirants tend to exceed the actual percentages at higher levels on these variables; whereas, at the lower levels, the actual percentages exceed the expected percentages.

2. Results indicate that coeducational institutions with equal proportions of males and females had facilitating effects on the Ph.D. aspirations of males.

F. Social orientation appears to have a complex, non-monotonic relationship to Ph.D. aspiration. The largest positive and the largest negative effects occur in adjacent intervals.

G. Analysis of expected Ph.D. aspiration level and actual Ph.D. aspiration in terms of student input variables, sex, intelligence and major field of study shows that:

1. Northeastern men's colleges produce significantly fewer students who aspire to the Ph.D. than would be expected on the basis of input ($p < .001$).

2. Technological schools do not differ significantly from other institutions.

3. Coeducational liberal arts colleges have a marked positive effect on students' Ph.D. aspiration level. Rates of Ph.D. aspiration were 1.5 times greater than expected ($p < .001$).

## CONCLUSIONS, IMPLICATIONS, RECOMMENDATIONS

1. In a quasi-experimental work such as this study, significant results may be the result of uncontrolled input variables, rather than differential influences of the institutions. However, in view of the controls used, it is likely that marked differences between expected and actual Ph.D. aspiration rates are related to environmental influences.

2. The design of this project is probably suitable for studying college effects. However, when it is feasible to regard input variables as continuous, and where interaction among predictors is not a major source of variance, there would be greater efficiency if a regression model rather than an actuarial table were used.

3. The effects of college characteristics on student motivation to seek the Ph.D. are exceedingly complex. None of the college variables had simple additive effects. The difficulty in interpreting the significant college effects indicates that a more intensive study of student-college environment interactions is necessary. While the gross variables used in this study are useful in identifying differential college effects, a more meaningful interpretation of such effects will depend ultimately on the ability to describe the college environment in terms of the experiences of the individual student.

AUTHORS: Alexander Astin and Robert J. Panos

TITLE: The Educational and Vocational Development of College Students

PUBLISHER: American Council on Education, 1969

MAJOR ISSUES:

Advanced formal education is the principal means for developing skilled manpower. In most countries this is accomplished by means of highly centralized and homogeneous institutions. In the United States, the system is largely uncoordinated and diverse. An investigation of the American system offers a unique opportunity to investigate a variety of approaches to undergraduate education.

While research has produced several suggestive findings concerning the nature of differential institutional influence on student development, their validity and generalizability have been questioned either because the methodology employed was inadequate or because the samples of institutions and students were biased.

The investigators believe that the study of a representative national sample of colleges will contribute to the understanding of the process of career choice and career development and of the interaction between the undergraduate student and his college environment. In addition, this information should aid in educational planning and manpower development.

OBJECTIVES OF THE STUDY:

General Objective:

To assess the significance of institutional diversity in the production of skilled manpower by comparing the effects of different college environments on the undergraduate student's educational and vocational aspirations.

Specific Objectives:

1. To measure changes in the students during their undergraduate years as revealed by a comparison of their responses in 1961 and 1965.
2. To identify institutional characteristics and educational practices that affect students' chances of completing college, going to graduate school and pursuing a career in a particular field.

MAJOR HYPOTHESES:

I. No specific a priori hypotheses were stated except in one case. The analysis of the data is presented in terms of the influence of personal and environmental factors on educational progress, plans, and career choice as follows:

   A. Student characteristics and environmental factors that affect completion of four years of college; obtaining a baccalaureate degree in four years; and in the four years following matriculation.

   B. Student characteristics and environmental factors that affect the level of students' educational aspirations.

   C. Student characteristics and environmental factors that affect performance on Area Tests of the Graduate Record Examination. For this analysis two hypotheses were stated:

      1. The academic excellence of the undergraduate institution as defined by the level of ability of the student body, the level of the institution's financial resources and the degree of academic competitiveness in the college environment - has a positive effect on the undergraduate student's intellectual achievement.

      2. The extent of positive effect of institutional quality on intellectual achievement is proportional to the student's academic achievement.

   D. Student characteristics and environmental factors that affect final choice of a major field and of a career.

DESIGN OF THE STUDY:

1. Four year longitudinal study.

2. Follow-up using a subsample of the group which was tested in 1961 and again in 1962.

DESCRIPTION OF SAMPLE:

1. Population: All freshmen at all accredited four - year colleges and universities in the United States as of Fall 1961.

2. Sampling procedure:

   a. In 1961:

      (1) All freshmen at institutions which were included in the study participated.

(2) Institution selection was based on stratified sampling. Procedures were not described. It was noted that the purpose of the stratification was to maximize institutional diversity.

b. In 1965:

(1) Retest was on random sample drawn from the original group of students. (This was done in order to keep the costs down).

(2) The sample included:

(a) All students from institutions enrolling fewer than 300 freshmen in 1961.

(b) A random sample of 250 freshmen attending larger institutions in 1961.

(c) A random sample of approximately 500 1961 freshmen from several of the large complex universities. (Institutions were not named).

(3) Selections for the various analyses were as follows:

(a) Random selection of every 8th case (used in the analysis to identify biasing variables).

(b) Every eighth student from the original sample who returned the long form of the questionnaire (used in the analysis to determine weights for the input variables).

(c) A subsample of the above (b) for whom scores on the National Merit Scholarship Qualifying Test were available (used in the analysis to determine if the effects of students' academic ability on various output criteria had been adequately controlled).

(d) Students for whom Graduate Record Examination Area Test scores and National Merit Scholarship Qualifying Test scores including institutional consent for their use were available (used in assessment of comparative institutional effects on students' academic achievement).

3. Size of sample:
    a. Number of institutions: 246, 80.8% of those invited accepted.
    b. Number of students:
        (1) 1961: 127,217 students
        (2) 1965: 60,505 were sent questionnaires; 30,506 (60%) returned long form of questionnaire; 5,899 returned short form of questionnaire after a second and third request.

        Total respondents from both returns: 68%

        (3) Number of cases used to identify variables
            (a) 4,003 used to identify biasing variables.
            (b) 3,821 used to determine weights for input variables and control effects of student input characteristics on the 28 outcome variables.
            (c) 1,590 used to determine if effects of students' academic ability on the various output criteria had been adequately controlled.
            (d) 669 from 38 institutions used to assess students' academic achievement and the comparative institutional effects on student achievement.

4. Sex: 56% male; 44% female

| | | Male | Female |
|---|---|---|---|
| 5. Race: | Caucasian: | 97% | 95.4% |
| | Negro | 1.8 | 3.8 |
| | Oriental | .5 | .3 |
| | Other | .2 | .3 |

| | Male | Female |
|---|---|---|
| 6. Religious Background: | | |
| Protestant | 66.2% | 68.2% |
| Roman Catholic | 21.9 | 21.6 |
| Jewish | 6.7 | 5.3 |

Limitations of the Sample:

1. Although the investigators were able to determine input characteristics of the non-respondents which would be biasing, they did not identify output characteristics of non-respondents which would introduce bias into the findings. In order to do this they would have had to have tracked down a sample of the group of non-respondents.

2. The sample size for the analysis of educational achievements is small relative to the population studied: 699 from 38 institutions versus 30,506 from 246 institutions.

3. Though somewhat larger, the samples chosen for the other analyses are also small (4,003, 3,821, and 1,590) relative to the total sample (30,506). No information is given regarding the number of institutions from which the samples were drawn. While the investigators state that the principal consideration for selection of the methods used in analysing the data was to produce maximally valid results, they also state that compromises were necessary because of the limits imposed by technical feasibility and computer costs. The extent and effects of the compromises that were made were not specified, (other than in the selection of only a portion of the original 127,000 students for restudy as opposed to restudy of the whole group). It is not clear if criteria of sample characteristics necessary for parametric statistics were met.

INSTRUMENTS AND MEASUREMENTS:

1. Questionnaire developed by staff sent to entering freshmen in 1961 designed to measure:

    a. Socioeconomic background as measured by: father's occupation and education.

    b. Academic and extracurricular achievement in high school (e.g. awards received; offices held in high school; grade point average; participation in competitions - arts, music, literary).

    c. Future vocational and educational plans (e.g. probable major areas of study; anticipated future occupation).

2. Follow-up questionnaire developed by staff sent in 1965 designed to measure:

    a. Student outputs, defined as:

        (1) educational achievements

        (2) educational aspirations and plans

    (3) career goals
    (4) number of years of completed college work

  b. College environment experiences:

    (1) financing of undergraduate education
    (2) living arrangements during college
    (3) use of undergraduate vocational counseling
    (4) marriage after entering college
    (5) participation in Undergraduate Research Program of National Science Foundation

3. Graduate Record Examination Area Test (GRE) scores for a selected sample were used as a measure of general educational development in three areas: social science, humanities, and natural science.

4. National Merit Scholarship Qualifying Test Scores (NMSQT) for a selected sample were used as a measure of academic ability.

5. Education Directory, Part 3: Higher Education and American Council on Education's American Universities and Colleges was used to obtain information on:

  a. Institutional characteristics

  (e.g. size, selectivity, permissiveness)

  b. Special educational experiences within the college

  (e.g. percent of students living in a dormitory; participating in honors program, etc.)

6. Inventory of College Activities (ICA) developed by Astin for his 1962 study designed to measure differences in college environments:

  a. Peer environment
  b. Classroom environment including Rate of Cheating
  c. Administrative environment
  d. Physical environment

7. Six measures based on Holland's classification of occupations were used to measure curricular emphasis of the institution:
   a. Realistic Orientation
   b. Scientific Orientation
   c. Social Orientation
   d. Conventional Orientation
   e. Enterprising Orientation
   f. Artistic Orientation
8. A group of forms (source not given) designed to gather information on standard typological classifications.
   a. Curricular emphasis (e.g. teachers' colleges; technological institutions; liberal arts colleges; universities).
   b. Type of control (e.g. private/public, non-sectarian/sectarian; Protestant/Catholic).
   c. Sex
   d. Race
   e. Geographic region
   f. Size of community

VARIABLES STUDIED:

1. Student input data at matriculation (data used was part of 1961 study)
   a. Abilities

      (e.g. high school grade point average, scores on National Merit Scholarship Qualifying Examination).

   b. Achievements

      (e.g. honors won, participation in extracurricular activities and contests, offices held)

   c. Family background

      (e.g. father's occupation, father's education
      1965 additions: mother's education, student's marital status at entrance, parents' income, race, religion)

d. Educational and career plans

(e.g. probable major field of study, highest degree planned, probable future occupation)

2. Student output data: (at end of four years)

a. Educational attainment

(e.g. completion of four years of undergraduate college within the four years following matriculation from high school; attainment of the bachelor's degree)

b. Educational aspirations

(e.g. highest degree sought four years after entering college: Master's, Ph.D. professional training)

c. Educational achievement

(e.g. scores on the three Area tests of the Graduate Record Examinations administered during the senior year)

d. Career plans

(e.g. final choice of a career)

3. College environmental data (data used was part of a 1962 study by Astin)

(e.g. the administrative and environmental characteristics of the students' institution as follows:

a. Peer Environment

(1) Competitiveness versus cooperativeness

(2) Organized dating

(3) Independence

(4) Cohesiveness

(5) Informal dating

(6) Femininity

(7) Drinking versus Religiousness

(8) Musical and artistic activity

(9) Leisure time

- (10) Career indecision
- (11) Regularity of sleeping habits
- (12) Use of the library
- (13) Conflict with regulations
- (14) Student employment
- (15) Use of automobiles

b. The Classroom Environment

- (1) Involvement in the class
- (2) Verbal aggressiveness
- (3) Extroversion of the instructor
- (4) Familiarity with the instructor
- (5) Organization of the classroom
- (6) Severity of grading (rate of cheating)

c. The Administrative Environment

- (1) Severity of administrative policy against drinking
- (2) Severity of administrative policy against aggression
- (3) Severity of administrative policy against heterosexual activity
- (4) Severity of administrative policy against cheating

d. The Physical Environment

- (1) Spread of the campus
- (2) Friendliness of the dorm counselor or housemother

e. The College "image" (student's subjective impressions of his college environment) included 8 image factors:

- (1) Academic competitiveness
- (2) Concern for the individual student
- (3) School spirit
- (4) Permissiveness

(5) Snobbishness

(6) Emphasis on Athletics

(7) Flexibility of the curriculum

(8) Emphasis on social life

STATISTICAL PROCEDURES:

1. Tabulations of data to give description of student characteristics by percentages.

2. Stepwise multiple regression analyses to identify biasing variables.

3. Linear multiple regression analyses to determine weights that could be applied to certain input variables to maximize prediction of the output variable.

4. Two stage analysis for determining environmental influence:

    a. Statistical adjustments of differential outputs on the basis of inputs.

    b. Adjusted student output related to environmental characteristics.

MAJOR FINDINGS:

I. Educational Development

A. Educational attainment: completion of four or more years of college during the first four years following matriculation from high school.

1. Nearly two-thirds of the Class of 1965 completed four years of college work; however, only about half obtained a baccalaureate degree during this time.

    a. Of the students who dropped out of the first college, more than one-half enrolled at a second institution.

    b. Only a small minority of the dropouts reported that either academic or disciplinary problems were the major reasons for leaving college and fewer than one in four indicated inadequate finances had led to the decision to drop out.

2. Certain student characteristics were associated with non-completion of a degree within four years after matriculation:

    a. Students who had relatively low grades in high school; who came from a low socio-economic status and whose racial background was either American Indian or "other" were more likely not to complete four years of college than students who had high grades in high school, came from relatively high socio-economic status and were Caucasian.

b. Students who declared business-secretarial or engineering as a career choice at entrance were more likely to drop out than students declaring other majors.

c. Although a greater proportion of women than men obtained a degree within four years after entering college, equal proportions of men and women completed four years of college credit during that period. When women's superior academic records were taken into account, however, it was apparent that women were more likely than men to drop out of college.

d. Parental financial support of a student at levels above 50% was associated with completing four years of college and obtaining a degree.

e. Being single at the time of matriculation was associated with completing four years of college and obtaining a degree.

3. Certain institutional characteristics were associated with completion of four years of college and obtaining a degree.

a. If a student attended a relatively selective institution where the peer environment was cohesive and the number of employed students was low, he was relatively more likely to persist and obtain a degree than if he attended a large university. Attendance at a university tends to increase a student's chances of dropping out.

b. Attendance at a Catholic institution increased a student's chances of persistence and completion of a degree.

c. Both men and women were more likely to drop out of college if they attended a coeducational institution. In institutions where there was a high frequency of informal dating, the drop-out rate was higher than expected on the basis of student inputs. The effects of this variable account in part for the effects of the non-coeducational institution's influence on persistence, since men and women's colleges tend to have very little informal dating.

d. Colleges where a relatively large percentage of students work for pay have considerably higher drop-out rates than were predicted by their student input.

4. There was a marked difference between institutions in terms of the actual percentages of students who completed four years of college in four years and who obtained the degree. Though the range was reduced when inputs were controlled, the variations remain extensive. The following chart illustrates the distribution of actual and residual scores on two criteria of educational attainment:

| | Actual Scores | | | | | Residual Scores | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Lowest % | Median % | Highest % | Mean | SD | Lowest % | Median % | Highest % | Mean | SD |
| Completed 4 years of college | 36 | 71 | 93 | 70.1 | 11.6 | -30 | 01 | 06 | -.6 | 7.9 |
| Obtained degree | 15 | 63 | 91 | 61.9 | 15 | -60 | 02 | 22 | -.3 | 10.9 |

5. In spite of the relationships indicated in the foregoing, there is limited ability to predict attrition defined as non-completion of degree four years after matriculation. The best linear combination of input variables accounts for only 9% of the variance.

B. Level of educational aspiration: plans to obtain a master's degree, a doctoral degree or a professional degree.

1. Nearly three-fourths of the total group of students reported that they intended to obtain a graduate degree even though many of them had not yet completed their undergraduate work.

    a. Men intending to do graduate work were about equally divided between those planning to get the master's degree and those planning doctoral-level or professional degrees.

    b. The vast majority of women planned to work for the master's degree only.

2. High level of educational aspiration (defined as desire for graduate degree) was positively related to:

    a. High level of educational aspiration at the time of matriculation

    b. High school grade point average of A

    c. High family income (this was positively related to obtaining professional degree; it was negatively related to plans for an "academic" graduate degree; students from less affluent families gravitated toward the master's degree)

    d. Sex (i.e. male).

3. Plans to obtain the doctoral degree were positively related to:

    a. Higher educational aspiration at time of matriculation

    b. High school grade point average of A

    c. Sex (i.e. male)

    d. Initial interest in science and achievements in science contests

    e. Career choices for which Ph.D. is an appropriate terminal degree.

4. Maintaining a high level or switching from a lower to a higher level of aspiration is positively related to:

   a. High academic record

   b. Initial career choice of field where graduate degree is appropriate

   c. Male status (women were relatively more likely than were men to change to a lower level of aspiration during the four years).

5. There is a wide range of level of aspiration within institutions. Some is related to student input; when effects of student input are controlled, there is still a wide range, as indicated in the chart below.

Distribution fo Actual and Residual Scores on

Criteria of Educational Aspirations

| | Actual | | | | | Residual | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Low % | Med % | High % | Mean | SD | Low % | Med % | High % | Mean | SD |
| Planning Graduate Study | 36 | 65 | 92 | 65.7 | 11.6 | -30 | -2 | 6 | -2.2 | 6.9 |
| Planning Ph.D. | 2 | 14 | 69 | 15.4 | 8.8 | -10 | -1 | 17 | -0.4 | 4.3 |
| Planning Professional Degree | 0 | 7 | 43 | 9.4 | 8.2 | -13 | 0 | 17 | -0.1 | 3.8 |

6. Certain institutional characteristics are associated with high educational aspirations:

   a. Selective private colleges located in the northeast, particularly if they have a high budget in terms of expenditures per student for educational and general purposes and if academic work is fairly demanding, tend to have students with high educational aspirations.

   b. Predominantly Negro colleges tend to facilitate a desire for obtaining a graduate degree.

   Universities in large cities and men's colleges, especially those in the Northeast, tend to facilitate interest in obtaining professional degrees.

They have a negative effect on interest in obtaining the Ph.D.

d. Technological institutions and selective co-educational liberal arts colleges tend to increase student's interest in obtaining a Ph.D.

e. Institutions in the Southwest tend to reduce interest in obtaining a Ph.D. and increase interest in obtaining a professional degree.

7. In spite of the relationships reported above, level of educational aspirations cannot be predicted very well. The percentage of variance which was accounted for by the variables relating to each outcome were as follows:

   a. Prediction of plan for a graduate degree: 12%

   b. Prediction of plans for a Ph.D.: 15%

   c. Prediction of plans for a professional degree: 21%

C. Educational achievement: scores on Graduate Record Examination Area Tests (social science, humanities, natural science).

1. The most important single determinant of level of achievement as a college senior is academic ability as measured during high school (NMSQT Scores).

   a. Verbal ability was most important in predicting achievement in humanities.

   b. Mathematical aptitude was most important in predicting subsequent level of achievement in natural science.

   c. Overall academic ability (as measured by National Merit Scholarship Qualifying Test composite score) was the best single predictor of achievement in social sciences.

   d. Males do better than females in natural science and in social science.

2. The second two most important predictors of undergraduate achievement were students' intended field of study and career choice at the time of matriculation.

a. Students in fields of study that were appropriate to particular Area Tests performed better than those in other areas.

b. Students choosing careers related to the subjects of particular Area Tests performed better than students choosing other fields.

3. The other variable related to performance on Area Tests was student's grade point average in high school. This carried positive weight in predicting achievement.

4. When the three sets of GRE Area Test scores were correlated with the ten measures of institutional quality, all 30 of the coefficients were positive; 27 of them were statistically significant. The range of statistically significant coefficients was from a high of .52 for expeditures and social science scores to a low of .08 for the number of books per student and natural science scores.

(There was a positive relationship between a college senior's intellectual achievement and the quality of his institution as defined in this study.)

5. However, when student inputs were controlled, the size of all the coefficients mentioned above were diminished and nearly half of them became negative. Only seven were statistically significant and of these, five were negative. Thus with student inputs controlled, institutional quality does not appear to have an effect on student achievement.

6. There was no observable pattern of institutional characteristics which either fostered or inhibited student achievement. College characteristics accounted for about 20% of social science achievement variance and 10% of the natural science and humanities variance. When student input was controlled the contribution of college characteristics shrank to about 5%.

Educational achievement is affected by differences that existed prior to matriculation. It is affected very little by the characteristics of the college environment including those characteristics associated with quality or excellence.

(Hypothesis I C rejected)

D. Choice of a career and of a major field of study.

1. About three-fourths of the students changed their long term career plans after entering college. The percentage who changed varied greatly among fields ranging from less than 50% in nursing and teaching (elementary and secondary) to over 90% for mathematicians, government service workers and diplomats.

2. Changes in career choice and in major field during undergraduate years were not random. In general, those who changed tended to switch to fields related to their initial choice. Balance of trade was not equal for all careers, since popularity for many changed during the four years following matriculation. The net percentage changed ranged from decreases of nearly 75% to increases of more than 400%.

3. The best predictor of final major field and career choice was initial choice. Sex had the second greatest predictive power: men moved toward "masculine" careers and women toward more "feminine" careers. This was also true for major fields.

4. Academic ability was also a predictor of career choices in some fields. Students with superior academic records in high school were more likely than were average students to make stable choices or to change their choice to college professor, lawyer, physical scientist, and physician.

   Also, students with better grades tended to remain in or to be recruited into biological sciences, engineering and the physical sciences and mathematics whereas students with poorer grades tended to remain in or to be recruited into business and education.

5. Parents' level of education had virtually no relationship to changes in career or in major field.

6. Parents' income had a relationship with career choice. Students from wealthier families were more likely to stay in or to be recruited into business or law than students from low income families who tended to be in or stay in engineering or teaching.

7. Father's occupation showed several systematic predictive relationships with career choice. If the father was a clergyman, a lawyer, a physician or a teacher, there was a tendency for student's final choice to be the same.

8. Race and religion had only a few scattered relationships to final major field choice. The Negro student was more likely than were others to choose a career in the health professions and to have a social science major. Jewish students were more likely to be in or to be recruited into law or medicine. Students whose parents were Catholic showed a tendency to change out of and avoid switching into education.

9. Students at liberal arts colleges tended to switch out of business, education and engineering and channel into majors in arts, humanities, and social science. Liberal arts colleges also appear to lessen students' interest in becoming lawyers and engineers and to increase their interest in becoming a physical scientist, a social scientist, a physician or a college professor.

   In general, the student's career choice tended to move into closer conformity with the more popular career choices among fellow students. This effect was particularly evident in the fields of engineering, teaching, and business law.

10. Career choices of engineer, lawyer and teacher were predicted with the highest degree of accuracy; the careers of biological scientist, performing artist, and social scientist were most difficult to predict.

11. Where the institution was used as the unit in controlling student inputs, fewer significant environmental effects were found than where the student was used as the basic unit in controlling differential inputs.

    When the college environment is viewed independently of the characteristics of its student body, its effects on the individual student's career and study plans appear to be trivial. There were several instances, however, where differences in student outputs that were not solely attributable to differential student inputs showed substantial relationships to the environmental characteristics of the institution.

College environments where there is considerable religious activity and little drinking tend to shift students away from potential careers in the arts and social sciences and into potential careers in the clergy, medicine and teaching.

CONCLUSIONS AND IMPLICATIONS:

1. According to the authors, the findings suggest that the large observed differences in educational outcomes among institutions are more a function of differences in entering students than of differences in measurable characteristics of the environment. Most of the environmental effects appeared to be mediated through the peer environment rather than the classroom, administrative or physical environments. Thus, further study of the nature and influence of undergraduate peer groups is clearly indicated. At the same time, a greater effort should be devoted to the identification of other effective environmental variables which are more directly manipulatable and not so highly dependent on the characteristics of the entering students.

2. Although dropping out of college was found to be related to several personal and environmental variables, an understanding of the principal causal factors is still very limited. Future studies of college drop-outs should employ a wider range of qualitatively different characteristics and environmental variables. Since persistence is associated with cohesiveness in the student body it might be possible to reduce drop-out rates if a greater degree of cohesiveness could be achieved. This is particularly important for public institutions whose drop-out rates are much higher than private institutions.

3. Regional differences in institutions may be in part attributable to the high concentration of men's and women's colleges in the Northeast and differences may be a function of their non-coeducational characteristics. It should be noted that non-coeducational institutions have potentially advantageous environmental features which are associated with educational development. Merging men's and women's colleges should be examined carefully in light of their present advantages.

4. The findings strongly support the hypothesis that college environments operate so as to produce a greater degree of homogeneity among the students with respect to field of study and career choice. Future research should be conducted to determine whether this "progressive conformity" holds true for other student characteristics, including values, beliefs, personal traits, and behavior patterns.

5. Several questions concerning the role of parental and family background characteristics in affecting the undergraduate's educational and vocational development merit further exploration. Do religion and occupation of the parents operate as environmental influences during the college years? Are the effects of socio-economic variables mediated through subtle motivational differences which were not detected in the freshman input measure?

6. The results suggest that the sex difference in academic performance which exists at the entering freshman level may be even more extreme at the graduate level, since those undergraduate women who go on to graduate work are more highly screened than are the undergraduate men. The factors associated with this loss of talented "womenpower" from the potential of graduate students constitutes a potentially important topic for research.

CRITIQUE OF THE STUDY:

1. A major limitation in this study concerns the narrow operational definitions of some of the major variables. For example, achievement is defined as the score on the Graduate Record Examination Area Tests and conclusions regarding educational achievement are tied to this definition. While the definition is narrow, discussion by the authors is widened and the term becomes "educational development" and "intellectual development". To generalize scores on the GRE to mean intellectual development is not warranted. Educational development is too complex a phenomena to be measured with a single index.

   The authors base their conclusions about the "folklore" of the effects of institutional excellence on these findings. Values and attitudes, however, are also significant areas of educational development on which college is presumed to have an impact. Astin and Panos do not deal with these areas.

2. There was no standard measure of academic ability for the group as a whole. High school grades which are not necessarily comparable, were the measure of ability used. While it is true that in one of the subsample analyses, scores on the National Merit Scholarship Qualifying Test were used, these were not available for the large group of nearly 30,000.

3. The significance of the findings is limited by the fact that outputs of non-respondents were not known, and the non-respondent group was large (32% to 40%). It is not clear if the sample representativeness was ascertained.

   A follow-up of 665 hard-core non-respondents is described in an appendix. An analysis of the rate of response by method of mailing is given. The authors suggest that an investigator would be well advised to choose from the relatively less expensive mail technique which had the highest rate of return for the initial wave of questionnaires and then to select a technique that would assure a high rate of return among non-respondents. There is, however, no analysis of the data obtained nor of its implications for the study.

AUTHOR: Jerald G. Bachman, *et al*

TITLE: *Youth In Transition, Volume I*: "Blueprint for a Longitudinal Study of Adolescent Boys" (one of seven proposed volumes)

PUBLISHER: Institute for Social Research, The University of Michigan, Ann Arbor, Michigan, 1967

MAJOR ISSUES:

The high school environment has significant effects on personality development since it not only defines the range of opportunities available to a young person, but it also influences the young person's choice of available opportunities. In general, what are the factors that account for the choice a boy makes to leave or to remain in school?

OBJECTIVES OF THE STUDY:

General Objective:

To assess a number of changes which occur during adolescence, including dimensions of self-concept, values, attitudes, plans, aspirations and behaviors and to determine how these relate to environmental characteristics and personal characteristics.

Specific Objectives:

1. To measure the background and personality characteristics of a sample of adolescent boys at three different times during the three year period beginning at tenth grade entrance and ending one year following high school graduation.
2. To determine the characteristics of the school and work environments of these boys in order to assess person-environment fit.
3. To determine the association between environments and changes which occur in boys.
4. To study the school as a formal organization in order to identify the organizational characteristics that relate to the drop-out phenomena.

MAJOR HYPOTHESES:

I. No specific hypotheses were given. However, the conceptual framework within which hypotheses were generated is described and illustrated on the following page. Each arrow indicates a set of hypotheses about a causal sequence. Each of the person, environment, and person-environment interaction variables will be paired singly and in clusters with each of the criterion variables which will also be treated singly and in clusters. The strength of these relationships will be examined. In total thousands of relationships will be tested. These relationships will cluster into five categories:

A. Effects of environments on criteria.

B. Effects of person characteristics on criteria.

C. Effects of person-environment interactions on criteria.

D. Effects of environment-environment interactions on criteria.

E. Effects of person-person interactions on criteria.

**Person**

- Aptitude and ability
- Motives
- Affective states
- Self-concept
- Values/attitudes
- Plans
- Behaviors
- Physical characteristics
- Job history
- Past experience

**Environments**

**School and/or job**

- Ability requirements
- Motive gratification/frustration
- Other job characteristics
- Other characteristics of schools

**Home**

- Family relationships
- Parental characteristics
- Sibling characteristics
- Resources in home environment

**Interpersonal influences via any environment**

- Influence sending regarding plans and behaviors
- Characteristics of friends
- Adult models

**Community characteristics**

**Person-environment interaction**

- Person-environment fit measures
- Aptitudes and abilities vs. ability requirements
- Motives vs. motive gratification/frustration
- (Many other combinations)

**Criteria**

- Affective states
- Self-concept
- Values/attitudes
- Plans
- Behaviors
- Aptitudes and abilities
- Motives

DESIGN OF STUDY:

1. Longitudinal
2. Combines depth of longitudinal study with the breadth of a nation-wide sample.
3. Covers a three year period with interval data collection as follows: October,1966, March, 1968, and November, 1969.

DESCRIPTION OF SAMPLE: Sample I: Probability sample

1. Size of sample:
    a. 2200 boys
    b. 87 schools
2. Population:
    a. All boys in the 10th grade in public high schools in the United States.
    b. All public high schools in the United States as of Summer, 1964, which had at least 15 boys in the 10th grade. This excludes less than 2.5% of all 10th grade public school boys.
3. Sex: males only
4. Racial composition: 1912 whites; 256 blacks; 45 other
    a. The sample of blacks were subdivided into groups based on location and school.
        (1) 73 attended integrated schools
        (2) 72 attended northern segregated schools
        (3) 111 attended southern segregated schools
    b. Number of schools attended by blacks
        (1) 183 students were in 9 schools (segregated)
        (2) 73 students were in 25 schools (integrated)
5. Religious composition: 63 percent Protestant; 20 percent Roman Catholic and Eastern Orthodox; 3 percent Jewish; and 14 percent Other and missing data.

6. Sampling procedure:

    a. Three step process involving stratification and clustering included:

        (1) Separation of the United States into 88 strata. The Survey Research Center has developed a sampling framework which divides the United States, excluding Hawaii and Alaska, into 88 strata with each stratum representing about 2 million people. 62 of these correspond to separate counties; the rest are grouped into 12 major metropolitan areas.

        (2) A random selection of a single school in each of the 88 strata was obtained. The probability of the selection of any school was proportional to the estimated number of 10th grade males.

        (3) A random sample of thirty boys was obtained within each school.

    b. Of the 88 schools drawn according to design, 71 responded affirmatively (81 percent).

    c. Replacement schools from the sample areas where schools had responded negatively were secured. 16 out of 17 accepted.

    d. Final response rate was 97 percent.

DESCRIPTION OF SAMPLE: Sample II: Supplementary, discretionary sample of outstanding schools

1. Size of sample:

    a. 300 boys

    b. 10 schools

2. Population: 17 schools selected for excellence in one or more of the following areas: academic curriculum, organizational innovation, student-faculty relations, vocational preparation or promoting student mental health.

3. Sampling procedure: Discretionary. Sample population was selected by a panel of experts in education. The names and qualifications of the experts who did the selecting and those who were selected is not given. The final sample consisted of those schools which accepted the invitations.

4. Rationale for supplementary sample: the representative random sample may not include many outstanding schools. It was felt that in a study designed to show what school environments can do, as well as what they typically do, such a defect might be serious, and to insure that there would be a sufficient number of outstanding schools, a special supplementary sample should be chosen.

LIMITATIONS OF STUDY DUE TO SAMPLING:

1. In terms of the purposes of the study, i.e., to determine factors related to drop-out, it might be more efficient to use a sample that would include proportional representation of minority groups or lower socioeconomic levels; those most likely to become dropouts. However, it was felt that such a sample would be difficult to select and that the study would be best served by a sample that permitted generalization to the entire population of boys in public high schools.

2. No provision is made to obtain data on work environments except from the boys themselves, as they become employed. While there are practical problems of obtaining information from employers, an accurate, complete description of work situations, comparable in scope to what will be obtained about schools, will not be accomplished. This will limit the extent to which conclusions can be drawn about aspects of the study concerned with work environments.

3. Limitations of findings in the area of race: the investigators report that the sample design is not well suited to the description and comparison of small subsets of the population, particularly when the subset is located in a small number of schools. The ability to generalize accurately from the black sub-sample is severely limited and the investigators argue against a strong concentration of racial differences with respect to this study.

INSTRUMENTS AND MEASUREMENT (TIME 1):

1. A student questionnaire developed by the staff (using some existing instruments and devising additional items) designed to measure:

    a. Affective states
    (e.g. self-esteem, depression, resentment, guilt, impulse to expression, life satisfaction)

    b. Personality dimensions
    (e.g. self-development and self-utilization, need for social approval, fear of failure, test anxiety, flexibility)

- c. School opinions (e.g. school influence description, attitudes toward teachers, attitudes toward school, probability of dropping out of school, deviant behavior in school)

- d. Values and attitudes (e.g. cultural values, job attitudes, internal vs. external control, political attitudes and information)

- e. Life outside of school (e.g. social and dating behavior, family relationships, physical health and appearance, political and religious preference, socioeconomic status, participation in activities)

- f. Delinquent behaviors

2. A structured interview designed by the project staff using existing instruments and their own questions were conducted to gather data on the following:

   - a. Peer relationships
   - b. Self-concept of school ability
   - c. General happiness
   - d. Motives
   - e. Job history and financial status
   - f. Future plans, interpersonal influence
   - g. Person-environment fit, self-identity dimensions
   - h. Dropping out and reasons for doing so
   - i. Paragraph comprehension test
   - j. IQ: from Quick Test of Intelligence developed by Ammons and Ammons (1962)

3. A Group Test Battery used to measure academic abilities and aptitudes consisted of the following:

   - a. Matrices, patterned after Raven's Progressive Matrices. It is thought to be relatively free from cultural and educational bias (Raven, 1951). The test is considered a useful predictor for individuals who have good reasoning ability but who may have difficulty in school achievement because of non-intellectual factors.

b. Gates Test of Reading Comprehension from the Gates Reading Survey, Teachers College, Columbia University used to measure reading achievement.

c. Anagrams, by Guilford: a verbal task which measures divergent thinking.

d. Maze tracing, a sub-test in the performance section of the Wechsler-Bellevue, was used as a measure of intelligence.

e. General Ability Test Battery (GATB), Part J: Vocabulary and Part I: Arithmetic Reasoning developed by the U.S. Employment Service designed to measure general intelligence.

f. Hidden patterns, a test obtained from the Kit of Cognitive Factors, developed by French et al, used as an indicator of cognitive style: of field independence-dependence.

g. The Job Information Test, a set of items designed by Karen E. Paige and Jerald G. Bachman, was used to measure knowledge about a wide variety of occupations.

INSTRUMENTS AND MEASUREMENT (TIME 2 and 3)

1. Will be essentially the same as those used for Time 1 with these omissions:

    a. Aptitudes and abilities

    b. Demographic information

    c. Future plans (Time 3 only) and these items marked "optional":

        (1) School motivation

        (2) Flexibility

        (3) Self-utilization opportunities (Time 3 only)

        (4) Family relationships

Instruments for measuring school environments: a special questionnaire was designed to obtain data about each school. Details concerning the data collection were not presented except that data would be collected from school staff. The topics that were to be covered by the questionnaire were as follows:

1. Inputs required by school
   (e.g. personnel, operating funds, buildings equipment and maintenance service)

2. Processes of allocation of inputs
   (e.g. extent to which staff of school is influential in procurement and allocation)

3. Resources currently held by the school (e.g. personnel, students, building grounds, equipment)

4. The School's Role System (e.g. stability of roles, changing role system,changing role occupants, balance between role prescriptions and individual role elaboration among teachers, evaluation of the system of roles, socialization of new members, evaluation of role performance, rewards and penalties, sources and nature of control of inputs, composition of role sets, maintenance of role occupancy)

5. Openness and closeness (e.g. changes in students: do they have increased skills and knowledge?; have they formulated career plans?; have they "matured"?)

7. Additional properties of organizational structure (e.g. size, degree of specialization, group norms, group structure)

Instruments for measuring work environments: not described.

VARIABLES STUDIED:

1. Student Variables
    a. General background (age, sex, race)
    b. Aptitudes and abilities (IQ, reading achievement)
    c. Motives (positive school attitudes, negative school attitudes, need for social approval, independence, achievement, need to avoid test anxiety, self-development needs, self-utilization needs)
    d. Affective states defined as:self-esteem, stability of self-esteem, independence, emotional dependence, impulse to aggression, overt aggression, depression, anomie, general anxiety, resentment, anxiety and tension, irritability, guilt, social support, sadness, physical symptoms, general happiness
    e. Self-concept: self-concept of school ability, self-development (aspired), self-utilization (perceived), dissatisfaction with self
    f. Values: kindness, honesty, social responsibility, reciprocity, social skills, academic achievement, physical development, religiousness, self-control, independence
    g. Attitudes: job preference, locus of perceived control over one's fate; internal vs. external trust in people, trust in government, flexibility, reasons why boys drop out

- h. Plans: future plans, importance of grades to plans, intentions to drop out, probability of dropping out
- i. Behaviors: academic achievement (grades), social and dating behavior, rebellious behaviors in school, delinquent behaviors in school
- j. Physical characteristics: appearance, physical maturity, height, weight
- k. Job history
- l. Past experiences: history of schooling
- m. Role conflicts

2. Environmental Variables--Family
   - a. Parental characteristics: age, religion, political preferences
   - b. Socioeconomic level defined as
     - (1) Father's occupation
     - (2) Educational attainment level of parents
     - (3) Intactness of family
     - (4) Number of books in home
     - (5) Possessions in home (TV, radio, encyclopedias)
     - (6) Number of rooms per person in home
   - c. Number of siblings
   - d. Family relationships
3. Environmental Variables--Interpersonal Influences
   - a. Influence by parent, siblings, teachers, friends
   - b. Influence on personal plans and behavior (dropping out, grades, delinquency, further education, changing jobs, military service)
   - c. Characteristics of friends: age, education, occupation
   - d. Adult model(s): parent closeness
   - e. Person-role conflicts
4. Environmental Variables--School
   - a. Structure: size, number of grades offered, system of offices and roles (organizational chart), size of classes, programs, courses, activities, ability grouping, counseling and guidance and placement facilities

b. Student body: selection of students, number of feeder schools, etc., racial mix, student turnover and dropout rates, percent going to college, delinquency and misconduct, average levels and heterogeneity/homogeneity along many other person dimensions, peer group structure

c. Administrative policies and practices: organizational innovation, goal setting, planning, implementation, assessment

school policies on admission, expulsion, readmission, placement (in programs), advancement, evaluation;

personnel policies: recruitment, evaluation, advancement, salary structure

patterns of power, influence and communication re: curriculum, classroom materials, other school policies

staff-school personnel (administration, teachers, counselors, specialists): number, shortages, turnover growth/decline, sex, race, background (proportions), qualifications, continuing education, levels of satisfaction, involvement, loyalty

5. Environmental characteristics--Community

   a. Region

   b. Rural - urban - suburban

   c. Socioeconomic level

   d. Population turnover: growth/decline

   e. Job market

6. Outcome variables: Levels of

   a. Vocational preparation

   b. Aspiration

   c. Skill, knowledge

   d. Self-esteem and affective states

   e. Satisfaction, self-utilization, self-development

   f. Self-concept

   g. Attitudes

   h. Motivation

   i. Behavior

   j. Amount of role conflict

STATISTICAL PROCEDURES:

1. Three broad strategies carried out sequentially are used:

   a. Index construction

      (1) In general, indices will be calculated by finding the arithmetic mean of the scores attained by a respondent on a number of items which are designed to measure a common characteristic.

      (2) Clusters of highly intercorrelated indices within the same general category will be identified. The same general strategy used in index construction will be applied but in this case, the cluster scores will be based on the means of inter-related indices; in effect each such score will be an index of indices.

   b. Correlational and multiple classification procedures will be used to examine the relationship which exists between pairs of variables.

   c. Longitudinal analysis

      (1) Comparison of measurements taken at two or three different points in time to assess causal directions underlying relationships.

      (2) Assessment of proportion of total change taking place in each interval. This will be used in examination of traits which are believed to be developing in a systematic fashion.

2. Descriptive statistics used to examine descriptive data include means, standard deviations and response distributions.

## MAJOR FINDINGS:

No findings are reported in this volume which is entirely devoted to a description of the research plan. Results are to be presented in a series of six additional volumes. See volume two for the preliminary findings.

## CONCLUSIONS:

This research plan is vast, complex and comprehensive. The prospects of cooperation in collecting large amounts of data from a nationwide sample of schools and boys appear good. If carried out according to plan, the analysis of the data should yield valuable information concerning the effect of high school experiences and work experiences on the educational, personal, and vocational development of boys.

AUTHOR: Jerald G. Bachman, et al.

TITLE: Youth In Transition, Volume II, 1970
"The Impact of Family Background and Intelligence
on Tenth-Grade Boys"

MAJOR ISSUES:

Though schools and colleges offer the opportunity for experience which has the potential of expanding a boy's educational, vocational and personal horizons, it is becoming increasingly evident that those who benefit most from formal education are those who bring certain predispositions to it. The family is recognized as a major influence on a child, since long before a child enters school, the family shapes his abilities and molds his attitudes, motivations and values. In order to understand a boy's response to high school and the choices he makes regarding post-high school, it is essential to understand some of the factors which have exerted an influence on him.

OBJECTIVES OF THE STUDY:

1. To select and define major dimensions of family background.
2. To see how the sample is distributed along each dimension and to consider the ways in which these dimensions are interrelated.
3. To examine the relationships between background factors and the criterion dimensions of aptitudes and abilities, affective states, aspects of self-concept, values and attitudes, behavior and plans.

MAJOR HYPOTHESES:

I. Personal Development:

   A. Each family background factor will be related to each of the personality dimensions.

      1. The family background factors are:

         a. Socioeconomic level

         b. Number of siblings

         c. Unbroken home

         d. Family relations

e. Family religious preference

f. Family political preference

g. Community size

h. Race

2. The personality dimensions are:

a. Self-concept of school ability

b. Motivation

c. Self-esteem and affective states

d. Values and attitudes

e. Behaviors

f. Educational and vocational aspirations

B. Ability tests scores will be related to the family background factors and the personality dimensions (listed above).

DESIGN OF STUDY:

1. See Abstract of Volume I for a full description of the design of the three year longitudinal study.

2. Volume II concerns a cross-sectional study of the data collected at Time Period I, Fall, 1966.

DESCRIPTION OF SAMPLE:

1. See Abstract of Volume I for a full description of the sample and the sampling procedures.

2. This study used the probability sample of 2,213 boys from 87 schools (as described in Abstract of Volume I).

INSTRUMENTS AND MEASUREMENT:

1. The measurements in this study were the structured interview, the questionnaire and the test battery.

2. See Abstract Volume I for a complete description of the instruments and measurements.

VARIABLES STUDIED:

1. Family background factors
    a. Socioeconomic level (SES)

       (e.g., defined as Father's occupation, parents' education, and family possessions)
    b. Number of siblings
    c. Unbroken home

       (e.g., intact, broken by death, broken by divorce, etc.)
    d. Family relations

       (e.g., perceived closeness to parents and kinds of punishments used by parents)
    e. Parents' religious preference
    f. Parents' political preference
    g. Community size
    h. Race
2. Intellectual Aptitude and Ability
    a. General intelligence

       (e.g., Quick Test score)
    b. Reading achievement

       (e.g., score on Gates Test of Reading Comprehension)
    c. Vocabulary

       (e.g., score on GATB, Part I)
    d. Job information

       (e.g., Job information test score)
3. Self-concept of School Ability

4. Motivation
    a. Positive school attitudes

       (e.g., index score)

    b. Negative school attitudes

       (e.g., index score)

    c. Self-actualization needs

       (e.g., need for self-development and self-actualization)

    d. Test anxiety

    e. Need for social approval

5. Self-esteem
    a. Negative affective states

       (e.g., irritability, general anxiety, tension, anomie, resentment)

    b. Happiness

       (e.g., subjective assessment of general attitudes and feelings)

    c. Somatic symptoms

       (e.g., physical complaints such as nervousness, headaches, loss of appetite, shortness of breath, dizziness, and trembling hands, etc.)

    d. Impulse to aggression

       (e.g., subjective feelings of aggressive nature: "I feel like picking a fight with my parents")

6. Values and Attitudes
    a. Social values

       (e.g., honesty, kindness, reciprocity, self-control, social responsibility, social skills)

    b. Job attitudes

    c. Internal versus External control of one's fate

    d. Attitudes of trust

       (e.g., trust in government, trust of people)

    e. Political knowledge

7. Behaviors
    a. Delinquent behaviors

       (e.g., 26 different behaviors ranging from staying out too late to very serious matters such as assault)

    b. Rebellious behaviors

       (e.g., 13 different behaviors ranging from coming late to class and cheating on tests to disrupting others' ability to work in class)

    c. Scholastic achievement

       (e.g., grade point average)

8. Plans and Aspirations
    a. Existence of college attendance plans
    b. Occupational aspiration

       (e.g., value of the boy's aspired occupation - level on Duncan's scale)

STATISTICAL PROCEDURES:

1. Product-moment correlation
2. Correlation ratio
3. Multiple Classification Analysis (MCA) designed by the staff. According to the investigators, MCA:
    a. Permits prediction of criterion dimensions using a number of background factors simultaneously.
    b. Provides an estimate of the effect of each predictor as if it were uncorrelated with all other predictors. It looks at predictors simultaneously and adjusts each to take into account its relationship to the other predictors.
    c. Assumes that predictor variables are combined additively and that there is no interaction among them.

d. Uses eta which is the correlation ratio. Eta is the proportion of variance explainable by the predictor operating alone.

e. Uses beta which is the correlation ratio adjusted for the effects of other predictors. Beta represents the sum of squares adjusted for the effects of other predictors.

## MAJOR FINDINGS:

### I. Personal Development:

A. When each family background variable was paired with each dimension of personality, a correlation ratio (eta) and an adjusted correlation ratio (beta) was calculated. Table I summarizes the strength which each family background variable showed in predicting the various personality dimensions.

B. The background factors showing correlations above .30 with some personality and ability dimensions are as follows:

1. Socioeconomic level: boys from high SES homes compared to boys from low SES homes tended to have:
   a. More positive self-concepts of their school ability
   b. More plans to go to college
   c. Higher level of occupational aspirations
   d. Higher Quick Test scores
2. Number of siblings: respondents with just one sibling have the highest mean QT score, and as the number of siblings increases beyond one, there is a steady decrease in mean QT score.
3. Family relations: boys having positive family relations scores compared to boys having low family relations scores tend to have:
   a. More positive attitudes toward school
   b. Fewer negative attitudes toward school
   c. A higher need for social approval
   d. High self-esteem
   e. High degree of reported happiness

f. Few somatic symptoms

g. Low impulse to aggression

h. Good social values (kindness, generosity, self-control, responsibility)

i. Higher job ambitions

g. Lower incidence of both delinquent and rebellious behavior

(Hypothesis I A and B confirmed for some variables)

TABLE I. Number of correlations of Family Background Variables with Personality Dimensions (listed according to strength)*

| FAMILY BACKGROUND VARIABLES | ETAS | | | | BETAS | | | |
|---|---|---|---|---|---|---|---|---|
| | 0-.10 | .11-.20 | .21-.29 | .30 & > | 0-.10 | .11-.20 | .21-.29 | .30 & > |
| Socio-economic Level | 3 | 9 | 4 | 3 | 7 | 4 | 1 | 0 |
| Number of Siblings | 3 | 9 | 2 | 1 | 12 | 1 | 0 | 0 |
| Unbroken Home | 11 | 2 | 0 | 0 | 12 | | | |
| Family Relations | 0 | 7 | 6 | 10 | 5 | 1 | 1 | 6 |
| Religious Preference | 4 | 13 | 2 | 0 | 12 | 2 | 0 | 0 |
| Political Preference | 8 | 5 | 0 | 0 | 12 | 1 | 0 | 0 |
| Community Size | 8 | 4 | 1 | 0 | 11 | 2 | 0 | 0 |
| Race | 11 | 4 | 0 | 1 | 6 | 7 | 0 | 1 |

* Total number of scores reported is not the same for each background predictor nor for etas and betas.

C. When Quick Test scores were paired with each family background variable and each dimension of personality, a correlation ratio (eta) and an adjusted correlation ratio (beta) were calculated. Data showing the strengths of these relationships is presented in Table II:

TABLE II. Number of correlations between Quick Test scores and Family Background and Personality Dimensions (listed according to strength)

| | ETAS | | | | BETAS | | | |
|---|---|---|---|---|---|---|---|---|
| | 0-.10 | .11-.20 | .21-.29 | .30 & > | 0-.10 | .11-.20 | .21-.29 | .30 & > |
| Background variables | 0 | 4 | 1 | 3 | 4 | 2 | 1 | 1 |
| Personality dimensions | 1 | 6 | 4 | 3 | 1 | 4 | 2 | 2 |

D. Family background factors found to be strong predictors of Quick Test scores were as follows:

1. Socioeconomic level:

   Boys from high SES homes tended to have high QT scores; those from low SES homes tended to have low QT scores

2. Number of siblings:

   Boys who had one sibling had the highest mean scores. As the number of siblings increases, there is a decrease in QT score.

3. Race:

   Whites tended to score highest followed by blacks in integrated schools; other racial minorities; blacks in northern segregated schools and blacks in southern segrated schools.

E. Personality dimensions found to be strongly associated with Quick Test scores were as follows:

   1. Self-concept:

      Boys with high QT scores tended to have positive self-concepts of their school ability more frequently than boys who had low QT scores.

   2. Political knowledge:

      Boys with high scores tended to have a higher level of political knowledge

   3. College plans:

      Boys with high scores tended to have plans to go to college.

   4. Occupational aspirations:

      Boys with high scores tended to have higher occupational aspirations than boys who had low Quick Test scores.

(Hypothesis I C, D, E confirmed)

CONCLUSIONS:

1. Family background is important in determining a boy's personal, educational, and vocational development.

2. Socioeconomic level (SES) is perhaps the most important background measure. It is related to most other background measures; what appear to be effects of other background measures can often be attributed equally well to SES. It plays an important part in shaping ability and has a positive influence on performance, aspirations, and important self-concepts. In short, the boys from high SES homes are doubly advantaged.

3. The family relations measure is also important, However, the investigators stress that they feel very cautious about conclusions based on the relationships between the family relations scores and criterion dimensions. They point out that of the family background dimensions studied, it is by far the most subjective and cannot be verified. Since it depends on self-report, subtle distortion can occur without a respondent being aware of it. In addition, the criterion dimensions which family relations predict well are also highly subjective: (e.g. aggressive impulses, negative school attitudes, need for social approval). The findings in this area should be viewed in light of these limitations. The source of the questions on family relations (Questionnaire D) is not cited. This is the only scale for which such information is not given.

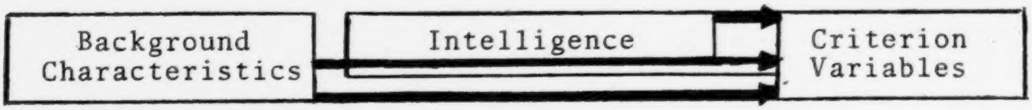
4. While the sample was not designed primarily to study racial differences, some points that might stimulate further study are:

    a. Blacks in integrated schools, in northern segregated schools and in southern segregated schools have differences that make it important that blacks not be studied as a single subgroup irrespective of the school environment and location.

    b. Blacks in northern integrated schools are very similar to whites in QT scores.

    c. When SES is controlled, blacks in southern segregated schools tend to be relatively higher in self-concept of school ability than whites.

5. Intelligence can be viewed in part as a result of background factors and also as a cause of other factors.



6. A small number of very general dimensions can summarize much of the measurable impact of family background on a wide range of outcomes. These are socio-economic level, family relations, race/school integration/region and intelligence. The practical value of this finding is that family background can be treated effectively using three or four basic variables.

AUTHOR: James S. Coleman

TITLE: Equality of Educational Opportunity

PUBLISHER: National Center for Educational Statistics
U.S. Department of Health, Education and Welfare
U.S. Government Printing Office, Washington, D.C., 1966

MAJOR ISSUES:

The presence or lack of educational opportunity is of fundamental significance to many social issues today. The determination of the amount of segregation as well as an assessment of the school facilities available to children in the United States is critical in order to build a sound basis for recommendations for improving their education.

MAJOR OBJECTIVES:

1. To determine the extent to which the racial and ethnic groups are segregated from one another in the public schools.
2. To determine whether the schools offer equal educational opportunities in terms of a number of other criteria which are regarded as good indicators of educational quality (e.g. numbers of laboratories, textbooks, libraries, etc; characteristics of the teachers and characteristics of the student bodies).
3. To determine how much students learn as measured by their performance on standardized achievement tests.
4. To attempt to discern possible relationships between students' achievement and the kinds of schools they attend.

HYPOTHESES: There were no a priori hypotheses in this study.

METHODOLOGY:

1. Purpose: Descriptive, to provide estimates for a large number of school, pupil and teacher characteristics for the nation; separate estimates for urban and rural localities in major geographic regions and reliable estimates so that comparisons could be made between Negro or other minority students and white students.

2. Type of Data Collected:

   a. Survey data from student questionnaires and tests of verbal ability, reading, and mathematics.

   b. Survey data from teacher, principal and superintendent questionnaires.

3. Type of Design:

   Cross-sectional study of public elementary and secondary schools in the United States.

4. Population:

   a. Target population: elementary and secondary school students, teachers, principals and superintendents in the United States.

   b. Experimental population: stratified sample of public elementary and high schools in the United States (see sampling procedures for details).

5. Sampling Procedures:

   a. Sampling design based on a two-stage probability sample of the public schools in the United States.

   b. Primary sampling unit*used was 2,883 counties of which 209 were metropolitan areas and 2,674 were counties located outside metropolitan areas.

      Counties were chosen because (1) census and other descriptive data were readily available for counties and (2) the county more than local school districts would provide greater internal heterogeneity which is more efficient.

   c. Counties were then assigned to one of two groups, metropolitan or nonmetropolitan, according to whether they were included in a standard metropolitan statistical area (SMSA) or not.

   d. The groups were then stratified by geographical location and by the percentage of non-whites in the psu (information obtained from County and City Data Book 1962, Bureau of the Census, U.S. Department of Commerce). The boundaries for the percentage nonwhite categories were set at:

*(psu)

1. 70% and over
2. 30 - 70%
3. 10 - 30%
4. under 10%

In nonmetropolitan counties the last category was broken down into:

4a. estimated nonwhite enrollment of 100 or more

4b. estimated nonwhite enrollment under 100.

The seven regions that were used and the States included in each region are presented below:

Region I, New England---Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont.
Region II,Mid-Atlantic--Delaware, Washington, D.C., Maryland, New Jersey, New York, and Pennsylvania.
Region III, Great Lakes-Indiana, Michigan, Ohio, Illinois, and Wisconsin.
Region IV, Plains-------Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, and South Dakota.
Region V, Southeast-----Alabama, Arkansas, Florida, Georgia, Kentucky, Louisiana, Mississippi, North Carolina, South Carolina, Tennessee, Virginia, and West Virginia.
Region VI, Southwest----Arizona, New Mexico, Oklahoma, and Texas.
Region VII, Far West and Rocky Mountain-----Alaska, California, Colorado, Hawaii, Idaho, Montana, Nevada, Oregon, Utah, Washington, and Wyoming.

e. Within each county and metropolitan area that was selected in the first stage, a listing of all public secondary schools with the 12th grade was obtained from the inventory of school plants. These listings were sent to the various State departments of education where the percent nonwhite enrollment in each school was indicated.

The secondary schools were then stratified into five groups according to nonwhite enrollment:

1. 75.1 - 100%
2. 50.1 - 75%
3. 25.1 - 50%
4. 10.1 - 25%
5. 0 - 10%

f. Since the grade spans for high schools varied, grade span coefficients were developed for each region and each grade span to obtain the necessary information about the estimated 12th grade and total enrollment in a psu. For example, the grade span coefficient to be used for high schools with grade span t through 12 where t = 6, 7, 8, 9, 10, and 11 was computed by:

$$\frac{\text{Total regional enrollment in grades 1 through 12}}{\text{Total regional enrollment in grades } t \text{ through 12}}$$

Within each stratum, the secondary schools were selected in a systematic manner, the sampling rate being determined by the number of secondary schools to be included in the sample from the stratum to the total number of secondary schools in the stratum.

g. Feeder schools: For each secondary school selected in the sample, the lower grade schools which feed their students into that secondary school were identified in addition to the percent of the feeder school students ordinarily attending the high school.

Each feeder school sending 90% or more of its students to a sampled high school was selected in addition to feeder schools with probability equal to the percent of students who go on to the sampled secondary school.

6. Description of Sample:

a. Institutions:

Final sample size of high schools = 1,170

high school principals = 1,170

elementary school principals = 3,223

b. Students:

1. All students in the sampled schools in grades 3, 6, 9 and 12 were tested.
   Grade 1: only half the fraction of students sampled in the other grades.

2. Final sample size 900,000

3. Racial composition:

   450,000 whites
   450,000 nonwhites
   279,000 metropolitan = 62% of total enrollment
   171,000 nonmetropolitan = 38%

4. Religious composition: Not reported.

7. Sample representativeness:

a. Subsample of 66 of the 352 secondary schools for which there were no principals questionnaires was randomly selected and surveyed. Estimates of nationwide average high school characteristics for whites and nonwhites were then calculated by letting the subsample of 66 schools represent the group of 352 schools for which there was no information and combining them with the questionnaires of the 818 principals that had originally responded.

b. Brief follow-up study to get indication of measurement error in survey due to erroneous reporting by pupils (on the basis that the factors creating these errors are fairly widespread and consistent in the U.S.). Revised questionnaires for grades 3, 6, 9, 12 consisted only of items that could be verified by school records. Sampled 2 districts in Tennessee (1 metropolitan and 1 nonmetropolitan). Concluded that pupils responded with reasonable accuracy to factual items about themselves, schooling, homes and families--no consistent pattern of increase or decrease in response accuracy.

The information derived from this follow-up examination of 66 schools indicates that the overall availability of school characteristics given in this report was understated by about 1 percentage point on the average and also that the difference between the availability to whites and nonwhites is understated by about 1 percentage point on the average.

VARIABLES:

I. Student Variables

- A. General background
- B. Ability and achievement
- C. Student behavior
- D. Academic variables--dropout, GPA, education history, aspirations, attitudes and interests.

II. Environment Variables - Family

- A. SES (e.g. items in home)
- B. Father's occupation
- C. Parents' education
- D. Academic expectations of parents
- E. Structural integrity of home (presence of father in home)
- F. Other language spoken in home

III. Environment Variables - School

- A. Student body characteristics (attitudes, racial composition, aspirations)
- B. Education of parents of classmates
- C. Facilities
- D. Special services
- E. Special programs
- F. Tracking
- G. Racial interaction
- H. Curriculum
- I. Extracurricular activities
- J. Faculty attitudes (race related issues, school policy)
- K. Principal and superintendent attitudes on policies and issues

INSTRUMENTS AND MEASUREMENT:

I. Achievement tests to measure accomplishments of school, criterion of achievement

- A. Grade 1
    1. picture vocabulary test - verbal ability
    2. association and classification tests - nonverbal ability
- B. Grade 3
    1. picture vocabulary test - verbal ability
    2. classification and analogies - nonverbal ability
    3. reading and math tests

C. Grade 6

1. classification and analogies - nonverbal
2. reading and math
3. sentence completion and synonym tests - verbal

D. Grade 9

1. classification and analogies - nonverbal
2. reading and math
3. sentence completion and synonym tests - verbal
4. general information

Test battery of published school survey tests:

ETS Sequential Tests of Educational Progress (STEP) reading and math
Inter-American Tests of General Ability - nonverbal
ETS School and College Ability Test (SCAT) - verbal comprehension

II. Questionnaires

A. Student

1. Grade 1 (teacher fills in)
   race, family size, education of parents, father's work, items in home, behavior, learning ability, etc.

2. Grade 3
   sex, race, size of family, satisfaction with school books in home, academic standing, expectations of parents, etc.

3. Grade 6
   size of family, age, sex, race, education of parents, items in home, academic expectations of parents, racial composition of class, race of teacher, expected occupation, etc.

4. Grade 9 and 12
   type of community grew up in, family size, foreign language in home, occupation of father, education of parents, items in home, academic program, educational expectations of parents, race of classmates and teacher, college plans, race of friends, extracurricular activities, grade average, track in English, work, counselor, opinion items, etc.

B. Principal

1. Existence of kindergarten, instructional programs, facilities, books in library, achievement tests, free lunches, equipment, tenure system, attendance, transfers and dropouts, destruction, drugs, non-whites, programs, post-graduate, representatives from colleges, reputation of school, personal (e.g. degree, years experience, college, field, racial composition of his college, location of college),tracking in school, policy for slow learners and advanced, special classes, opinion items on educational policy, e.g. bussing .

C. Teacher

1. Sex, race, parents education, major, degree, academic level of college, teaching experience, assignment to present school, salary, academic ability of students, satisfaction with job, racial composition of class, opinion on school issues, learning related problems (e.g. home environment), counseling, test of verbal ability.

D. Superintendent

1. Assignment of teachers, qualification of teachers, current school issues, personal information (age, sex, degree, race),appointed or elected, system statistics, expenditures, etc.

III. Data Analysis Strategies and Statistical Procedures

A. Multiple regression analysis

B. Correlation matrices for major regressions

C. Ratio-estimate procedure

D. Analysis of variance

E. Single-variable correlations

MAJOR FINDINGS:

I. Educational Development

A. Segregation

1. The great majority of American children attend schools that are largely segregated. Negroes are the most segregated of the minorities but considering all groups white children are the most segregated.

a. Almost 80 percent of all white pupils in first grade and twelfth grade attend schools that are from 90 to 100 percent white.

b. Ninety-seven percent at grade one, and 99 percent at grade twelve attend schools that are 50 percent or more white.

c. For Negro pupils, segregation is more nearly complete in the South (as it is for whites also) but it is extensive also in all the other regions where the Negro population is concentrated: the urban North, Midwest and West.

d. More than 65 percent of all Negro pupils in the first grade attend schools that are between 90 and 100 percent Negro.

e. Eighty-seven percent at grade one, and 66 percent at grade twelve, attend schools that are 50 percent or more Negro. In the South most students attend schools that are 100 percent white or Negro.

f. Mexican-Americans, Indian Americans, and Oriental Americans attend schools with pupil environments very similar to those of whites.

2. The same pattern of segregation holds, though not quite so strongly, for the teachers of Negro and white students.

a. For the nation as a whole, the average Negro elementary pupil attends a school in which 65 percent of the teachers are Negro; the average white elementary pupil attends a school in which 97 percent of the teachers are white.

White teachers are more predominant at the secondary level, where the corresponding figures are 59 and 97 percent.

b. On a nationwide basis, in cases where the races of pupils and teachers are not matched, the trend is in one direction: white teachers teach Negro children but Negro teachers seldom teach white children.

B. School Facilities

1. For the nation as a whole white children attend elementary schools with a smaller average number of pupils

per room (29) than do any of the minorities (which range from 30 to 33).

2. Secondary school whites have a smaller average number of pupils per room than minorities, with the exception of Indians.

3. Nationally, Negro pupils have fewer of some of the facilities that seem most related to academic achievement (e.g. they have less access to physics, chemistry, and language laboratories; fewer books per pupil in libraries, insufficient supply of textbooks; schools are less often accredited; the curriculum is less often built around an academic program).

4. Even greater than the majority - minority differences, however, are the regional differences. For example, 95 percent of Negro and 80 percent of white high school students in the metropolitan Far West attend schools with language laboratories, compared with 48 percent and 72 percent, respectively, in the metropolitan South.

C. School Programs

1. Minority groups have less access to curricular and extracurricular programs.

2. Secondary school Negro students are less likely to attend schools that are regionally accredited, particularly in the South.

3. Negro and Puerto Rican students have less access to college preparatory curriculums and to accelerated curriculums; Puerto Ricans have less access to vocational curriculums as well.

4. Less intelligence testing is done in schools attended by Negroes and Puerto Ricans.

5. White students in general have more access to a more fully developed program of extracurricular activities, in particular those related to academic matters (e.g. debate teams and student newspapers).

6. Regional differences are notable. For example, 100 percent of Negro high school students and 97 percent of whites in the metropolitan Far West attend schools having a remedial reading teacher compared with 46 percent and 65 percent, respectively, in the metropolitan South - and 4 percent and 9 percent in the nonmetropolitan South west.

D. Principals and teachers

1. One percent of white elementary pupils attend a school with a Negro principal, whereas 56 percent of Negro children attend a school with a Negro principal.

2. The average white student goes to an elementary school where 40 percent of the teachers spent most of their lives in the same town, city or country; the average Negro pupil goes to a school where 53 percent of the teachers have lived in the same locality most of their lives.

3. The average Negro student, relative to the average white student, attends a school in which the guidance counselors are less experienced and less often are affiliated with professional guidance organizations, but they are not less often trained specifically in guidance nor less frequent readers of guidance journals; and in which the teachers are:

    a. neither more nor less likely to have high absenteeism rates,

    b. paid more in some regions and less in others; thus the national averages are about the same,

    c. more likely to have requested assignment to their particular school and to expect to make a lifelong career of teaching,

    d. less likely to wish to remain in their present school if given a chance to change, or to declare they would reenter teaching if the decision could be made again,

    e. less likely to rate students high on academic motivation and ability,

    f. less likely to believe that the school has a good reputation with other teachers,

    g. less likely to prefer to teach in an academic high school,

    h. more likely to spend a substantial amount of time in class preparation,

i. more likely to teach large classes,

j. more likely to spend time counseling with students,

k. somewhat more likely to have taught in the school the prior year,

l. more likely to take a teacher's examination as a condition of employment

m. less often prefer to teach children from white-collar and professional homes,

n. less often prefer to teach Anglo-Saxon pupils,

o. less often prefer to teach white pupils,

p. less often prefer to teach high-ability pupils,

q. less often favor the concept of the neighborhood school,

r. favor bussing of elementary pupils,

s. favor compensatory education at extra cost (although a strong majority of the teachers of whites also favor it),

t. agree that it is educationally sound to have white teachers for nonwhite pupils and nonwhite faculties for white pupils.

4. The average Negro student attends a school where a greater percentage of the teachers appear to be somewhat less able (as measured by indicators such as types of colleges attended, years of teaching experience, salary, educational level of mother, and score on a 30 word vocabulary test) than those in schools attended by the average white student.

Specifically, compared to the teachers of the average white pupil, the teacher of the average Negro student is:

a. more likely to have lived most of his life in the current county,

b. more likely to have finished high school in the current county,

c. as likely to have attended college within the State,

d. more likely to have lived much of his life in a large city,

e. less likely to have well educated parents (especially in the South),

f. more often male in the metropolitan South; more often female in the metropolitan Southwest, at least at the secondary level,

g. as likely to be old, as likely to be young,

h. much more likely to be Negro in every region,

i. much more likely to serve under a Negro principal.

Compared to teachers of the average white student, teachers of the average Negro are:

a. more likely to score lower on a test of verbal competence, and the difference is most pronounced in the Southern states,

b. neither more nor less likely to have advanced degrees,

c. more likely to have slightly more teaching experience, and slightly more tenure in their present school,

d. more likely to have read more professional journals,

e. neither more nor less likely to have majored in an academic subject,

f. if elementary teachers, less likely to be trained in teachers colleges,

g. more often products of colleges that offer no graduate training,

h. attended colleges with a much lower percent white in the student body,

i. less often rate their college high in academic quality,

j. less often are members of academic honorary societies, at least in the South,

k. more often participate in teachers' organizations especially in the South,

l. more often have attended institutes for the culturally disadvantaged.

E. Student Body Characteristics

1. The average Negro has fewer classmates whose mothers graduated from high school; his classmates are more frequently from large rather than small families; they are less often enrolled in a college preparatory program; they have taken a smaller number of courses in English, Mathematics, foreign language, and science.

2. On most items, other minority groups fall between Negroes and whites, but closer to whites, in the extent to which each characteristic is typical of their classmates.

F. Achievement in the Public Schools

1. The average minority pupil, with the exception of the Oriental American, scores distinctly lower on standardized achievement tests at every grade level than the average white pupil (as much as one standard deviation below the majority students' scores in the first grade).

   At the twelfth grade, results of tests in the same verbal and nonverbal skills show that, in every case, the minority scores are farther below the majority than are the first graders.

   Moreover, the deficiency in achievement is progressively greater for the minority pupils at progressively higher grade levels.

2. By grade twelve, both white and Negro students in the South score below their counterparts - white and Negro - in the North. In addition, Southern Negroes score farther below Southern whites than northern Negroes score below northern whites.

3. However, the Negro achievement in the North may be artificially elevated because some of those who achieved more poorly left school. In the metropolitan North and West, 20 percent of the Negroes of ages 16 and 17 are not enrolled in school - a higher dropout percentage than in either the metropolitan or non-metropolitan South.

G. Relation of achievement to school characteristics

1. The schools are remarkably similar in the way they relate to the achievement of their pupils when the socioeconomic background of the students is taken into account. Differences between schools account for only a small fraction of differences in pupil achievement.

2. Schools do differ in their relation to the various racial and ethnic groups.

    a. The average white student's achievement is less affected by the strength or weakness of his school's facilities, curriculum, and teachers than is the average minority pupil's achievement.

    b. Twenty percent of the achievement of Negroes in the South is associated with the particular schools they go to, whereas only 10 percent of the achievement of whites in the South is so associated.

    c. This general result is found for all minorities except Oriental Americans.

3. Among the facilities that show some relationship to achievement are those for which minority students' schools are less well-equipped relative to whites (e.g. the existence of science laboratories showed a small but consistent relationship to achievement and minorities, especially Negroes, are in schools with fewer of these laboratories).

4. The quality of teachers shows a strong relationship to student achievement, particularly for minority students, and is progressively greater at higher grades, indicating a cumulative impact of the qualities of teachers in a school on the student's achievements.

Of the teacher characteristics measured, those that bear the highest relationship to student achievement are:

a. the teacher's score on the verbal skills test,

b. the teacher's own level of education and that of his parents.

On both of these measures, the level of teachers of minority students, especially Negroes, is lower.

5. Student's achievement is strongly related to the educational background and aspirations of the other students in the school. This effect is less for white pupils than for any minority group other than Orientals:

   a. The average white elementary school child attends a school where 87 percent of his classmates are white. The average Negro attends a school where 16 percent of his classmates are white.

   b. The average minority student is more often in classes with students whose mothers are less educated than is the average white, the differences being especially great for Negroes and Puerto Ricans.

   c. Negro and Puerto Rican children are more likely to be in classes with a large number of students from broken homes.

   d. Minority group children are consistently in classes with children from larger families than majority group children.

   e. The average minority group student is in a class with children who have fewer items (e.g. telephone, vacuum cleaner, automobile) in their homes than is the average white student.

   f. The various races are about equal in their exposure to fellow pupils who reported their parents to be highly interested in their education.

   g. Minority children tend to attend classes with children who report less reading matter (e.g. newspapers, encyclopedias, and number of books in their home) than do white children. This discrepancy is especially great for Negroes and Puerto Ricans.

h. Fewer Negroes have definite plans for college, but fewer have definite plans not to attend, indicating the lesser concreteness and greater uncertainty, in Negroes' aspirations.

   The Negroes actually reported especially high levels of motivation, interest, and aspirations compared to whites of comparable economic levels. Negroes are especially strongly oriented toward the school as a path for mobility but the results suggest a considerable lack of realism in aspirations, especially among Negroes whose responses deviate most from actual rates of college-going and completion of high school.

i. Oriental Americans show by far the highest aspirations toward college of any group in the entire sample, 64 percent reporting wanting to finish college or go beyond.

6. The variability between individuals within the same school is roughly four times as large as the variability between schools.

   a. The pupil attitude factor which bears a stronger relationship to achievement than all the "school" factors together, is the extent to which an individual feels that he has some control over his own destiny.

   b. Minority students, except for Orientals, have far less conviction than whites that they can affect their own environments and futures. When they do, however, their achievement is higher than that of whites who lack that conviction.

      Negro students are more likely than white students to be exposed to classmates who have feelings of powerlessness over their environment.

   c. While this characteristic shows little relationship to most school factors, it is related for Negroes to the proportion of whites in the schools. Those Negroes in schools with a higher proportion of whites have a greater sense of control.

H. Negroes and higher education

1. Over half of all Negro college students attend the largely segregated institutions in the South and Southwest.

2. About 4.6 percent of all college students are Negro (11.5 percent of college-age persons are Negro).

    a. Negroes are less exposed than whites to students who have read a college catalogue or talked with a college official about going to his college.

    b. Minority groups, especially Negroes and Puerto Ricans tend to be in schools where fewer students go on to college than are whites.

    c. More of the classmates of whites than of Negroes are in a college prep curriculum (39 percent versus 32 percent) and are taking courses ordinarily required for college (science, English, and foriegn languages).

    d. Negroes attend schools with less favorable academic environment (measured in terms of overall grade average in school and scores on the tests administered as part of this survey) than whites.

3. Negro students are proportionally in colleges with lower proportions of Ph.D. faculty; substantially lower faculty salaries.

4. In every region Negro students are more likely to enter the State college system than the State University system and they are a smaller proportion of the student bodies of universities than any other category of public institutions of higher education.

5. Negro students are more frequently found in institutions which have a high dropout rate; they attend mainly institutions with low tuition costs.

6. Negro students tend to major in engineering, agriculture, education, social work, social science, and nursing.

    The following findings are based on comparisons limited to students in colleges that have a primary goal in the training of teachers and is not a random sample of all colleges.

7. Majority students being trained at the college level to enter teaching have a stronger preparation for college than have Negro students; they have had more courses in foreign language, English, and mathematics, made better grades in high school, and more often were in the highest academic track in English.

8. Substantial test score differences exist between Negro and white future teachers at both freshman and senior levels, with approximately 15 percent of Negroes exceeding the average score of majority students in the same region. (In no case do as many as 25% of Negroes exceed the majority average.)

9. Test data indicate that the gap in test results widens in the South between the freshman and senior years. This finding is particularly significant since most Negro teachers are trained in the Southern states.

10. Preferences of future teachers indicate that:

    a. far too many future teachers prefer to teach in an academic high school,

    b. there is a much greater proportion of children of blue-collar workers than of teachers being produced who prefer to teach them,

    c. there is a substantial number of white teachers-in-training, even in the South, who prefer to teach in racially mixed schools,

    d. very few future teachers of either race wish to teach in predominantly minority schools,

    e. high ability students are much more popular with future teachers than low ability ones.

I. School enrollments and dropouts

1. Seventeen percent of Negro adolescents (aged 16 and 17) have dropped out of school; the corresponding number for white adolescents is 9 percent. Most of this difference comes from differences outside the South since in the South the white and Negro non-enrollment rates are much the same.

2. The dropout rate is different for different socioeconomic levels.

    a. Minority group children are more likely to attend school with students who will drop out before graduation than are majority children.

The nonenrollment rate was 3 percent for those 16 and 17 year olds from white collar families; it was more than four times as large (13 percent) in the case of those from other than white-collar families.

This difference in nonenrollment by parental occupation existed for both male and female, Negro and white adolescents.

3. The dropout rate varies according to the metropolitanism of the area as well as by South and non-South.

   a. The largest differences between Negro and white dropout rates are seen in the urban North and West.

   b. In the urban areas of the South, white girls drop out at a greater rate than Negro girls, and in the non-urban areas white boys drop out at a substantially greater rate than Negro boys.

## J. The Effects of Integration

1. The analysis of the test performance of Negro children in integrated schools indicates positive effects of integration, though small ones.

   For grades 6, 9, and 12, in almost every case, the highest average scores were obtained for Negro pupils whose classmates were more than 50 percent white.

2. Those students who first entered integrated schools in the early grades record consistently higher scores than the other groups, although the differences are small.

   When differences in students' socioeconomic status are taken into consideration, the performance in integrated schools and in schools integrated longer remains higher. Thus, although the differences are small, and although the degree of integration within the school is not known, there is evident, even in the short run, an effect of school integration on the reading and mathematics achievement of Negro students.

## K. Special Studies - Project Head Start

This analysis is based only on pupils who participated in Head Start just prior to entering first grade. The research design entailed comparison between three groups:

1. Head Start participants
2. Nonparticipants attending the same school as participants
3. Nonparticipants from communities where the program was not available.

Findings indicate that:

1. Head Start participants have not yet attained the academic competence of their classmates in the same schools, particularly whites. The performance of participants is almost universally below that of children in areas where the Head Start program was not offered.

2. Head Start participants in both metropolitan and nonmetropolitan areas of the South (South, and Southwest) and the non-South (Northeast, Midwest and West), had less likelihood of attending kindergarten than nonparticipants in the Head Start program from the same schools.

   A smaller proportion of participants attended kindergarten than did pupils from areas where Head Start was unavailable; the exceptions to this are in the cases of all Southern Negroes, and whites in the nonmetropolitan South.

3. Negroes in the South who participated in Head Start programs scored higher on tests of verbal and non-verbal ability than students who did not take advantage of the program, whether or not they had attended kindergarten previously. However, they did not score consistently higher than students from communities where the program was not offered suggesting that self-selection into the program may account for the differences.

   In addition, Negroes who participated in Head Start programs had a greater percentage of favorable responses to questions of educational motivation than did Negroes in the same schools who did not participate.

4. The pattern in general for both ability tests and educational motivation has been that Head Start participants perform better than nonparticipants from communities where the program was offered only in the case of Negroes, with white participants generally performing at a lower level than nonparticipants.

   Furthermore, in the case of test scores, participants tend to score lower than pupils attending school where the Head Start program was unavailable. Much of this variation, however, may be due to the fact that the family backgrounds of participants differed from that of non-participants.

5. Family characteristics:

   a. Whites who participated were less likely to have their real father (or stepfather) living in the home than were nonparticipants in either control group. Negro participants from metropolitan areas have a real father in the home more often than do nonparticipants in either control group.

   b. In general, Head Start participants are from poorer families than nonparticipants, and in most cases, nonparticipants attending schools in which Head Start was offered are poorer than children in communities where the program was not available.

      The exception to this is for Negroes in the South, where participants and nonparticipants in the same schools were of comparable SES, and the schools without Head Start programs in metropolitan areas contained students from poorer families than schools with programs.

      The results indicate that children from most deficient family backgrounds benefit most from programs like Head Start, both in terms of their scores on ability tests and evaluations made by teachers concerning their classroom behavior and greater interest in school.

CONCLUSION:

The principal way in which the school environments of Negroes and whites differ is in the composition of their student bodies. Moreover, the composition of the student bodies has a strong relationship to the achievement of Negro and other minority students.

Thus if a white student from a home effectively supportive of education is put in a school where most of the students do not come from such a home environment, his achievement will not be very different than if he were in a school composed of others like himself. But if a minority student, particularly a Negro, from a home without much educational strength is put with schoolmates with strong educational backgrounds, his achievement is likely to increase.

This general result, taken together with the earlier examinations of school differences, has important implications for equality of educational opportunity.

AUTHOR: Thomas L. Hilton

TITLE: A Study of Intellectual Growth and Vocational Development

PUBLISHER: U.S. Department of Health, Education and Welfare, March, 1971

MAJOR ISSUES:

Although a great deal of research has been conducted on vocational and intellectual development in secondary education, much work is needed concerning the interaction of environment, in terms of both a student's background and his educational activities, and his academic and vocational progress. Closing this information gap is especially important for helping those students who do not pursue a college education: knowledge about the nature of intellectual and vocational development and of the environmental factors influencing a student's decisions and successes or failures will contribute to more effective planning for these students.

OBJECTIVES OF THE STUDY:

General objective:

To investigate student vocational and academic development and the relationship of school, community and family background characteristics as well as curriculum enrollment to these two types of growth.

Specific objectives:

1. To describe various vocational curricula in a national sample of high schools and to describe the students enrolled in them.
2. To describe the intellectual development of high school students who choose vocational curricula rather than college preparatory programs.
3. To investigate the interaction of vocational plans, academic preparation, individual characteristics and educational and vocational activities.
4. To study the effect of school, community, and regional characteristics on students' educational decisions and achievement.
5. To investigate the causes of school withdrawals.
6. To compare the achievement of Negro students with that of white students within different curricula.

MAJOR HYPOTHESES:

Because the purpose of this series of studies was descriptive and exploratory, a priori hypotheses were not formulated. Instead, each of the studies of subsamples begins with a brief description of the purpose of that study.

METHODOLOGY:

This study consists of eight substudies, based on one major longitudinal survey. The following section describes the parent study, the Study of Academic Prediction and Growth (the Growth Study), conducted by the Educational Testing Service. The next section outlines briefly the major substudies, which used the Growth Study sample as their population.

1. Purpose: Exploratory and descriptive
2. Type of data collection: Survey
3. Type of design:
    a. Pre-experimental and quasi-experimental
    b. Longitudinal. The period of time covered for each student varied from a minimum of 1 1/2 years for the first group of 11th graders tested in 1961, who were tested for the last time in their senior year in 1963, to a maximum span of 8 years for the first group of 5th graders tested in 1961, who were tested every two years through 11th grade and again in 12th grade. This survey was also cross-sectional in that, during the first collection of data in 1961, students in 5th, 7th, 9th, and 11th grades from various regions and communities were sampled. Furthermore, at each subsequent administration, as each class was tested, all students, whether or not they were part of the 1961 sample, were also tested.
4. Population:
    a. Target population: Although this is nowhere explicitly defined, the author attempts to show that the longitudinal sample approximates other national random samples. It may be deduced that the target population is all American students between grades 5 and 12.
    b. Experimental population: Twenty-seven high schools in 17 communities. The Growth Study population consists of students in all these high schools as well as in the junior high schools and elementary schools which feed the high schools. In the initial 1961 testing, there were

32,000 students participating: 9,000 each from the 5th, 7th and 9th grades and 5,000 11th graders. In 1963, 1965, 1967 and 1969, seniors were also tested.

In 1963, 93% of the original subjects were retested, but since the Growth Study tested all students in the target classes, the sample size now totaled 40,000. After this, the total sample increased by 25% at each testing, while the core sample decreased by 15%, so that at the time of the final administration, there were 45,901 in the total samples, of whom 15,124 of the original 1961 participants remained. (See attached copy of Figure 1. Testing Plan for the Study of Academic Prediction and Growth.)

5. Sampling procedure:

a. Institutions: High schools were chosen on the basis of geographic location, size of system and proportion of graduates attending college. No random sampling procedures were used to select these schools. In addition, the sample consisted of students from junior high school and elementary schools feeding the high schools. A numerical breakdown of high schools according to the three criteria listed above shows the following distribution patterns:

(1) Geographical location:

| | |
|---|---|
| New England/Mid Atlantic: | 7 |
| North Central: | 9 |
| So. Central/So. Atlantic: | 5 |
| Mountain Pacific: | 6 |

(2) Percentage of graduates going to college:

| | |
|---|---|
| Under 35%: | 10 |
| 35 - 70%: | 10 |
| Over 70%: | 7 |

(3) Size of school (by senior class enrollment):

| | |
|---|---|
| Over 200: | 14 |
| 100-200: | 3 |
| Under 100: | 10 |

(4) Although the percentage of students enrolled in vocational curricula varied widely, the average enrollment in such programs was 40%.

b. Sample Representativeness:

The author compared the Growth Study sample to other national samples and writes that it approximates randomly selected samples: however, no criteria for comparison were stated. In addition the SES of the Growth Study sample was compared to that of the Survey on Equality of Educational Opportunity (the Coleman Study) and was found to be similar except that the Growth Study sample was slightly underrepresented at low SES levels and slightly overrepresented at high SES levels.

7. Non-respondent Follow-up Procedures:

Not described for the Growth Study sample (only one sub-study outlined its follow-up procedures).

INSTRUMENTS USED:

1. School and College Ability Tests (SCAT): Verbal and Quantitative
2. Sequential Tests of Educational Progress (STEP): Reading, Writing, Listening, Social Studies, Science, Mathematics
3. College Entrance Examination Board: Preliminary Scholastic Aptitude Test (PSCAT): English Composition, American History
4. Test of General Information (TGI): Home Arts, Industrial Arts, Physical Sciences, Art and Music, Biological Sciences, History and Literature, Entertainment and Recreation, Public Affairs
5. Background and Experience Questionnaire (BEQ): Provided data on activities in and out of school, covering both academic and vocational interests as well as recreational activities.
6. Adult Experience Questionnaire (AEQ): a post-high school survey instrument used to collect data on work and college experiences or aspirations.
7. Community and School Climate Questionnaire (CSCQ): Completed by school principals

In addition to administering these instruments, some of the schools and communities were visited by the research staff.

VARIABLES AND MEASUREMENT PROCEDURES:

A. Because many of the variables were used interchangeably as independent or dependent according to the substudy being described, no attempt is made here to categorize them as "dependent" or "independent". The two major variables used in the substudies were intellectual growth and curriculum enrollment.

   1. Intellectual growth: defined in terms of both ability and achievement at any one time as well as growth over a period of time.

      a. Ability: As measured by the School and College Ability Tests (SCAT), Verbal and Quantitative. In addition, seniors were given the Preliminary Scholastic Aptitude Test of the College Entrance Examination Board.

      b. Achievement: As measured by the Sequential Tests of Educational Progress (STEP)--Reading, Writing, Listening, Social Studies, Science and Mathematics; and two achievement tests from the College Entrance Examination Board, English Composition and American History, administered to 12th graders.

         In addition, the Test of General Information (TGI) was developed for the Growth Study. The TGI tested for information not necessarily taught in school but which might be learned by "an alert and reasonably well-informed adult". The TGI included eight scales: Home arts, Industrial arts, Physical Sciences, Art and Music, Biological Sciences, History and Literature, Entertainment and Recreation, and Public Affairs.

   2. Curriculum enrollment: Students had 8 categories with which to designate their programs: Academic, Agricultural, Vocational, Business-Commercial, General, Home Economics, Other, Undecided.

      It should be noted, however, the studies do not all use these 8 categories; in some cases, the only distinction made is between college preparatory and non-college preparatory students.

   3. Non-cognitive variables: Many non-cognitive data were collected, primarily from the Background and Experience Questionnaire (BEQ), described below. The number and types of items used from the BEQ varied among the studies. Although the descriptions of the individual subsamples give a more detailed listing of the variables studied, three of the more frequently described variables are given below:

   a. SES: parents' education, occupation, and the number of bathrooms in student's home.

   b. Parental support for student's academic activities and aspirations.

   c. Post-high school plans and activities

4. Other environmental variables:

   a. School attended

   b. City or region where school is located

B. Data Analysis Strategies and Statistical Procedures:

   1. Conditions for validity. With the exception of the minimal description of verification procedures given under the section on sample representativeness, no statements concerning the internal, ecological or population validity were made by the author.

   2. Statistical procedures:

      a. Multivariate analyses of variance

      b. Covariance adjustments

      c. Univariate F tests

      d. Discriminant scores, discriminant function coefficients

      e. Principal component coefficients, correlation coefficients.

      f. Multiple regression analyses

      g. T-tests

      h. Centour scores, (see p. 137)

      i. Chi square tests

      j. Path analyses

      k. Gross percentages

SUBSTUDIES:

I. Study of the number of and differences among students enrolled in various high school curricula (Chapter 5-A).

The sample consisted of 6,415 11th graders, grouped by curriculum, and compared on the following variables: ability (SCAT), achievement (STEP, TGI), post-high school plans, SES as measured by level of parents' occupation and education, and interest in and perceived utility of courses. In addition, the test scores of those students were compared at the 5th, 7th, 9th and 11th grades to obtain measures of academic and achievement growth.

II. Study of the intellectual growth of students in various curricula from grades 7 - 11(Chapter 6-A). There were 2,952 students in the sample. Independent variables were 18 comprehensive high schools, five different curricula and sex. Dependent variables included achievement (STEP), ability (SCAT), and SES.

III.This study investigated the impact of school and community characteristics on the vocational decisions and academic achievement of its students (Chapter 7). Three high schools in three small communities were chosen, the population ranging from 6,000 to 12,000. The author felt that each of the three communities represented common types and that each had certain characteristics which would affect the nature and quality of education in its schools. The towns were:

a. Richton: a middle-class, suburban community of 10,000 which was close to a large industrial and cultural center. The parents of the Richton students, while financially supporting their schools, were not particularly concerned or involved with the educational system, leaving their children's education entirely up to the school.

b. Junction City: an agricultural, economically depressed community of 8,000, one-fourth of which is of Mexican descent.

c. Plainsville: a prosperous, agricultural community of 6,000, whose population both financially and in spirit support their schools.

A total of 387 students were tested in 11th grade in these communities, 215 of them from the original 5th grade Growth Study sample.

Measures of a school's effectiveness included STEP achievement tests between 5th and 11th grades; the percentage of students going on to some sort of post-secondary education and the percentage of students enrolled in vocational curricula.

In addition, three other variables, identified as "cultural patterns", were used: responses of students regarding hours spent per day on homework, parental orientation toward education and SES.

IV. An investigation of differences in the achievement scores of Negroes and whites (Chapter 8): The SCAT and STEP scores of 316 Negro and 501 white students were compared at the 5th, 7th, 9th and 11th grades. The sample was chosen from six high schools in two cities, one in the Midwest and one in the West. The proportion of blacks enrolled in the schools ranged from 10 - 90%. In addition to the variables of ability and achievement, SES, curricular enrollment, city and school were used in assessing the impact of race on achievement.

V. This study focused on the early identification (5th grade) of students who would later drop out of school (Chapter 9): The sample was comprised of 68 students who were tested in 5th grade and again in 7th grade but who had dropped out of school by the time of the 11th grade administration. The sample was chosen from a Northeastern urban school system with 23 elementary schools. Independent variables were SCAT and STEP scores at 5th and 7th grades, and age in 5th grade. A sample of 81 students, matched with the experimental group according to sex, race and elementary school attended, but who had not dropped out of school by the 11th grade, was used as a control group.

VI. An investigation of non-cognitive variables in a student's background which affect his achievement in a given curriculum (Chapter 10): 9th graders , 1,494 from three high schools were compared first in terms of under- or over-achievement. Predictors for achievement were SCAT scores. Criteria for under- or over-achievement were five STEP scores and rank in class. The students were then compared by curriculum on the following five background variables:

a. Exposure to a middle-class environment and its concommitant stimulation.

b. Parental attitudes toward academic achievement.

c. Father's attitude toward post-secondary education.

d. Amount of non-school related reading.

e. Time spent on technological or vocational activities.

VII. A study of variables affecting post-high school activities. This study utilized two samples:

a. All 1967 Growth Study high school graduates--5,542 students

b. 3,058 students who had graduated in 1965. These students were chosen from four high schools in an Eastern city and six were in a Western city.

Since this study was conducted in 1968, the first group had been out of high school for one year and the second, three years.

Independent variables used included academic aptitude (SCAT), SES, sex, high school curriculum and, for the second group only, location of high school by city. The dependent variable for both groups was educational attainment--how much, if any, college education had each student obtained since high school graduation.

VIII. This study was primarily concerned with the factor consistency of the Background and Experience Questionnaire: Responses in the 7th, 9th and 11th grades were compared and changes in the presence or absence of 11 factors were noted. In addition, the longitudinal sample was compared to the cross-sectional one. The former sample consisted of 2,070 students; no total figures were given for the cross-sectional sample, although the author indicates that in grade 7 there were 6,608 students in the cross-sectional sample, of which 32% were also part of the longitudinal group. The 11 factors were:

a. Feminine-Esthetic Interests

b. Sports and Masculine Interests

c. General Social and Leisure Activities

d. Broad Reading Interests

e. Talk with Others (about Plans and Interests)

f. Academic Course Interests

g. Musical Activities

h. Lower level Social and Leisure Activities

i. Technical Hobbies and Interests

j. General TV Viewing

k. Academic Effort

MAJOR FINDINGS:

I. Educational Development:

   A. Subsample I:

      1. Overall, 50% of the students identified themselves as enrolled in academic programs, 17% in business, 13% in general education, 9% in vocational curricula, 1% in home economics, 2% in other programs and 4% undecided.

      2. Interviews of students in the western United States indicated that for many students curriculum identification had no meaning: because of the large number of open-admission schools in the West, students did not need to pursue college preparatory programs in high school in order to gain admittance into college.

      3. The proportion of students enrolled in academic curricula varied widely among schools and was dependent, in part, upon such variables as:

         a. Presence of a technical high school in the area - increased academic enrollment.

         b. Presence of an open-door 2 or 4 year college - decreased academic enrollment.

         c. Job market in the area - effect not specified.

         d. SES level of students' parents: generally, the number of students enrolled in an academic curriculum will be about 80% of the number of students having fathers who are college graduates; 32% of the students in academic programs had fathers who were college graduates compared to 8% of the fathers of non-academic students. A similar trend existed for academic students with professional fathers (18%), compared to non-academic students with fathers in professional occupations (4%).

      4. A relationship existed between students enrolled in academic programs and parental encouragement to continue their education after high school: for the academic students, 88% of the mothers and 85% of the fathers encouraged them to go to college, while 54% of the mothers and 52% of the fathers of non-academic students did so.

5. There was no clear relationship between curriculum and post-high school plans: only 22% of the non-academic students planned to go directly to work or into military service; 34% indicated that they would continue their education. For academic students the figures were respectively 5% and 78%.

6. The curriculum enrollment of a student was related to the educational aspirations of his peers: for 70% of the academic students, 60% or more of their friends planned to go on to a four-year college; only 28% of the non-academic students reported as high a percentage of college-bound peers.

7. Of all the students surveyed, vocational students indicated the most interest in their courses; and vocational courses were considered to be the most useful.

8. Girls achieve STEP Reading and Writing scores which were significantly higher than those of boys at the 7th, 9th and 11th grade levels; but, by 11th grade, the boys had gained a significant lead over the girls on STEP Mathematics and Science scores.

B. Subsample II:

9. From 7th grade on, students who were to later choose academic programs had significantly higher scores on ability and achievement tests, as well as on measures of parents' SES, than students who later entered non-academic curricula.

10. Seventh grade students who later chose vocational curricula achieved higher scores on STEP Science, (and maintained this lead) than students who selected other non-academic programs.

11. At grade 9, vocational students achieved higher scores on STEP Listening when compared to other non-academic students but fell behind all other groups on STEP Reading and Social Studies.

12. As students progress, SES increasingly discriminates among curricular groups, with higher SES students over-represented in college preparatory programs.

C. Subsample III:

13. A school in an economically depressed community may have many students with unrealistic aspirations: in one such community, Junction City, only 8% of the students were enrolled in vocational or business curricula, compared to 70% in college preparatory programs. However, of the 61% of Junction City graduates who continued

their education, very few went to four-year colleges and "a number went" to a local 2 year school (no percentages were given by the author). In comparison, 41% of the Richton students were enrolled in vocational or business curricula and 56% were in academic programs. 72% of the high school graduates of this school continued their education, 27% going on to 4 year schools and 22% to 2 year colleges. Half of the 58% of the Plainsville graduates continued their education going to a 4 year school; the other half attending a 2 year institution. Of the students surveyed in Plainsville, 24% were enrolled in vocational or business curricula and 65% were in college preparatory programs.

14. A school which is "too indistinguishable from" the community it serves, in terms of values may restrict its attempts to "broaden" and "enrich" its students (p. 112). It may, however, offer students more self-confidence in continuing their achievements. Although the author gives some figures (see those on the Plainsville school above) to support the latter half of this conclusion, no attempts are made to justify the statement about the "broadening and enrichment" of students.

D. Subsample V:

15. Age in fifth grade was the best single predictor of later withdrawal from school: in fifth grade, students who later dropped out were approximately one year older than those students who did not eventually drop out of school.

16. Those students who later dropped out of school obtained scores on ability and achievement tests which were significantly lower than those of students who continued through the 11th grade.

17. There were no significant differences in the rate of achievement growth from fifth to seventh grades when dropouts were compared to non-dropouts.

E. Subsample VI:

18. Only about 30% of the variance in post-secondary educational attainment for men and 40% for women could be explained by a combination of aptitude, SES and high school curriculum.

19. Prediction of college entry or educational attainment cannot, therefore, be based upon high school curricula: many nonacademic students went on to college; and a significant number of college preparatory students went directly to work after high school.

20. The highest correlation between high school curriculum and post-graduation activities was that of students who pursued clerical programs and who went directly to work after high school.

21. Over 40% of the vocational men, but only 17% of the women enrolled in business curricula, continued their education.

22. For both sexes, aptitude and parents' SES were related to high school curriculum and also to post-high school educational attainments, regardless of curriculum.

23. For men, aptitude was correlated as much with educational attainment as curriculum; for women, curriculum had a more significant impact on educational attainment than aptitude. Men and women in college-preparatory curricula went on to college in similar proportions -- 77% and 76%, respectively. But when all curricula were combined, the percentages were 64 and 53, respectively.

24. In the Western city sampled, where a number of 2 and 4 year open-admissions colleges were available, 80% of both sexes had been enrolled in college at one time or another. In the Eastern city, which had only one extension center and two small private colleges, less than 60% of the men and under half of the women had continued their education at all.

25. There was also a difference, albeit smaller, in the aspirations of students in each of the two cities to pursue graduate studies: in the Eastern city, 15% of the men and 6% of the women planned to do so; in the Western city, the numbers were 20% and 14%, respectively.

26. Depending on city and sex, 25% to 40% of the sample had been college students for most or all of the three years since high school graduation. Another 20% to 40%, depending on the same variables, had been in and out of college.

## II. Cognitive Development:

### A. Subsample I:

1. In 11th grade, academic students achieved higher scores

than non-academic students on all STEP and SCAT tests; on some tests, the difference was as great as four years, particularly on STEP Mathematics and Reading subscales.

2. On the Test of General Information, in the period between the 5th and 11th grades, the vocational students gained in overall scores while the academic students lost. The author notes that this may be attributable to the industrial arts scale, on which vocational students did very well.

B. Subsample II:

3. Between grades 7 and 11, the rate of growth of academic students as measured by SCAT and STEP was evenly distributed among all the tests. Furthermore, these students made greater gains in growth than the non-academic groups, whose growth rate was unevenly distributed among the various tests.

4. Although in terms of general achievement, students in higher SES high schools performed better than students in lower SES schools, some of the latter schools showed greater achievement gains between 7th and 11th grades on specific tests such as STEP Listening and Science.

C. Subsample III:

5. Where parents were not concerned with a school's program, regardless of the money they were willing to spend on education, the school was less effective in terms of post-secondary educational attainment than it might otherwise have been. Richton's students exhibited little interest in or motivation to continue their education.

D. Subsample IV:

6. In the fifth grade, Negro students were about one year behind whites on STEP Mathematics and SCAT Verbal and Quantitative scores and the gap increased over the years: by 11th grade, the Negro students were from 2 to 4 years behind white students on the various tests.

7. No significant relationship was found between curriculum and race. Generally the cognitive growth of Negro students relative to whites was not dependent upon curriculum. Within each curriculum, Negroes achieved lower scores than their white counterparts. Negro students in academic programs had test scores similar to non-academic white students.

8. Schools with the highest percentages of Negro students obtained the lowest achievement scores.

9. On certain STEP tests and at certain levels, academic Negroes in one town achieved higher scores than Negro students tested in a second town, suggesting that location may affect achievement.

10. Differences in the mean growth of blacks and whites may be a function of family background: parents of white students had completed more schooling and were working in higher status occupations than the parents of black students. Also, non-academic whites had SES backgrounds similar to those of academic blacks.

E. Subsample VI:

11. Overachievers, regardless of their curricular enrollment, were more similar with respect to certain background characteristics (See Subsample VI description) than underachievers in either the same curriculum or others.

12. For all four curricula studied, underachievers, when compared to overachievers: (1) did more non-school related reading in their leisure time; (2) more often had fathers who did not encourage them to go on to college; and (3) spent more time outside school on technological or vocational activities than did their overachieving peers.

F. Subsample VIII:

13. In a study of response patterns to 11 factors in the Background and Experience Questionnaire, patterns in the 9th grade diverged significantly from those exhibited in 7th and again in 11th grades, suggesting that the 9th grade is an important transitional period for students. Some of the differences were:

    a. The factors of "Sports and Masculine Interests", "General TV Viewing", and "Musical Activities" were present to a much greater degree in the 7th and 11th grade responses than in those obtained in the 9th grade survey.

    b. "General Leisure and Social Activities" and "Lower level Social Activities" increased sharply in Grade 9 as compared to the presence of the two factors in Grades 7 and 11.

    c. The "Feminine-Esthetic" factor increased in the 9th and 11th grades when compared to 7th grade responses, while "Talk with Others" and "Academic Course Interests" was in greater evidence in 7th grade than in the next two grades tested.

## IMPLICATIONS AND RECOMMENDATIONS:

1. The most significant finding of the study was that non-academic students fall far behind their academic counterparts in achievement scores. Since approximately half of all 11th graders in the study belong to this category, the question of what should be done about the gap demands immediate attention: Should more rigorous attempts be made to reduce these discrepancies or should other growth criteria be introduced?

2. The discovery that a student's perception of his abilities, based primarily on grades he has received, is a determining factor in his choice of curriculum has serious implications for grading practices. First, educators must carefully consider whether or not grades, as well as test scores, should play the part they now do in directing students into various curricula.

   Secondly, if grades are to be so utilized, schools must make greater efforts to see that grades are a valid assessment of a student's abilities. Furthermore, the author recommends schools institute special programs to help teenagers make career decisions, so that such decisions are less haphazard and not based exclusively on such data as grades received.

3. Another important implication of this series of studies concerns the differences in achievement of Negroes and whites. The author suggests that greater efforts be made to help black students in the early grades. Similarly, the identification of and aid to potential dropouts should start in elementary school.

4. Based on the finding that there is no significant relationship between high school curriculum followed and post-high school activities, Hilton suggests an assessment of the various curricula commonly offered in high schools to see if they meet the broader educational goals espoused in the United States, as well as to ascertain whether or not such programs are effective in meeting the needs of individual students.

5. In addition to outlining the major implications of these studies, Hilton indicates the direction that future research should take. First, if a model of educational and vocational development is to be constructed we need a better understanding of the psychological processes in such development. A correlate of this is the necessity for further investigation of these variables:

   a. Achievement in non-traditional areas

   b. Environmental influences affecting intellectual and vocational development, including both school and community characteristics

   c. Studies of the educational process itself to determine which aspects help or hinder an individual's progress.

Furthermore, in assessing any school's effectiveness, however measured, the author insists that the attrition rate of that school be included as a criterion of output, for the ability of a school to retain its students, even at the cost of lowering its gross academic record, is a crucial measure of its quality.

Lastly, Hilton reminds researchers of the problem of biasing the outcome of a study: a student who is questioned about his career plans may be influenced in his decisions by those very questions. Methodological procedures must be designed which do not inadvertently affect the decision-making process.

## EVALUATION OF THE STUDY:

This series of studies resulted in important findings for educational planning, the most significant of which are summarized in the preceding sections. Nevertheless, a number of shortcomings are apparent.

As a general criticism of the volume, the most noticeable flaw lies in its *ad hoc* nature: although in the beginning of the book a long list of objectives is stated, these objectives are not pursued in any cohesive fashion in the book, nor was there any attempt to integrate overlapping objectives among the studies.

This complaint reflects more than semantic quibbling: competent research must clearly explicate its objectives primarily for the sake of conducting meaningful and valid research but also because if such research is to be read and applied, it must appear in coherent form. In attempting to summarize these studies, therefore, the major difficulty was obtaining a comprehensive overview of findings, a procedure which involved sorting through overlapping findings and trying to highlight the most significant among them.

One example of the lack of clarity is the presentation of the study of post-high school activities (Chapter 11). Two samples were used -- graduates who had been out of high school for one year and also another group who had graduated three years prior to the survey. In the summary of findings, the author often did not identify which of the two groups was the reference point of the conclusions, making the findings themselves unclear.

A related criticism is that, frequently, insufficient information was given about each substudy. In Chapter 5, for instance, one is told that over a period of time, vocational students exhibit greater gains on the Test of General Information than the academic students. The author writes, "Presumably this reversal of the growth pattern is directly attributable to the content of the scale, ie, items measuring knowledge of industrial arts." (p.51) Unfortunately, scores on only one other subscale of the TGI are shown and the reader is left to wonder about the "presumability" of the conclusion.

Furthermore, and due partly, this reviewer believes, to the lack of attempts to integrate the results of the studies, the studies contradict each other. For example, in Chapter 5, reporting on the achievement growth of the various curriculum groups between 5th and 11th grades, the author writes "...the figures for the various achievement and ability measures are extraordinary in one particular respect...the stability of the trend lines for each curriculum group." (p. 51) Chapter 6, however, found differences in growth rates among the curriculum groups with respect to various subtests: "While the pattern of growth in achievement for the academic group appears evenly distributed across the areas covered by the STEP and SCAT tests, the same cannot be said for the non-academic groups. Their growth appears less general, and limited to such areas as STEP Science or STEP Social Studies." (p. 85)

While differences in findings from differing samples is to be expected, a discussion of such differences should be undertaken when a series of substudies is presented as a composite, as in this case.

Not only were objectives ill-defined, but occasionally measures of the "effectiveness" of a school suffered from the same deficiency. This is particularly true in Chapter 7, "The School and Community as Factors in Student Achievement." Many of the author's criteria for the effectiveness of a school are not explicitly stated: at one point he indicates a low drop-out rate as a positive attribute of one school, leading the reader to believe that this was to be one criterion of effectiveness He did not, however, go on to present the attrition rates at the other two schools. Another implied criterion was the number of students enrolled in vocational curricula. Again, the author did not indicate any yardstick by which to judge the relative success or failure of each school. Is there an optimum proportion of students who should be enrolled in vocational programs? If so, how is this determined? These are important questions which the author seems to have overlooked.

Hilton believes that in a town such as Plainsville, where the values of the school are the same as those of the community, that the school will not "...enrich and broaden the students' sense of the many ways life may be led, apart from local mores." (p. 100) Nowhere does the author give an operational definition of "broaden" or "enrich", much less test his conclusion. A similar example of unfounded conclusions made in this study is that students in a depressed community (such as Junction City) may have unrealistic aspirations. The school in Junction City "...seems to invoke more fantasies than real future plans in the children. I want to study piano in Ireland because I once read a story about a girl there and it was so romantic." Although the author may have more evidence to support his conclusion, one quote from one student surely is not sufficient.

Two of the major limitations, then, of A Study of Intellectual Growth and Vocational Development are the incompleteness of data presented and the lack of integration of findings both with each other as well as with stated objectives.

In addition to these two criticisms, there is a third, methodological question regarding the representativeness of the parent sample, the Growth Study. The reader is told only, "The opportunities we have had to compare the Growth Study sample with randomly selected nationwide samples indicates that the Growth Study sample quite closely approximates a randomly selected sample." (p.9) The author should have specified the criteria on which the Growth Study was compared to national samples as well as identifying these samples.

In conclusion, although the above criticisms are significant ones, the fact remains that this series of studies focused on important issues and its findings should be of great value to American educators.

AUTHOR(S): Husen, Torsten - Editor
Associate editors: Bloom, Benjamin; Hartung, Maurice; Peaker, Gilbert F.; Pidgeon, Douglas A., Thorndike, Robert L.; Walker, David A.

TITLE: International Study of Achievement in Mathematics--A Comparison of Twelve Countries (2 volumes)

PUBLISHER: Almquist and Wiksell, Stockholm; John Wiley, New York, 1967

MAJOR ISSUES:

Education is causally related to society's systems of economic growth and social change.

The issue of this study concerns the search for underlying, causal dimensions which may be common to the development and current status of national educational systems.

OBJECTIVES OF THE STUDY:

General Objectives:

1. To determine the influence of societal changes in patterns of living and the development of industrial and technical products upon mathematics teaching and learning.
2. To locate differences in various types of school systems both between and within countries on performance in mathematics on the basis of both system input and output variables.

Specific Objectives:

1. To investigate the effect of school organization, selection procedures and differentiation upon students' mathematics performance and attitudes toward mathematics.
2. To compare the differential effects of curriculum and methods of instruction on students' performance in and attitudes towards mathematics.

MAJOR HYPOTHESES:

I. Educational Development

   A. Family Environment

      1. There will be a systematic difference in socio-economic status between students in Populations I and those in Populations 3.

2. Students will have more interest in mathematics when:
    a. They describe mathematics teaching as emphasizing inquiry.
    b. They view mathematics as an open system.
    c. Their father's occupation is a high status one.
3. When the school program is held constant, the total mathematics test scores of pupils of lower socioeconomic status will differ from those of pupils of higher socioeconomic status.
4. The difference in mathematics achievement between lower and higher occupational status levels:
    a. Will be least when students are in schools which have the greatest variability in occupational status levels.
    b. Will be greatest when students are in schools which are most homogeneous with respect to occupational status levels.
5. When the level of mathematics instruction is held constant, there will be differences in mathematical achievement between students from urban and rural homes.

B. Personal Characteristics

1. Total mathematics scores will be related to students' interest in and attitude toward mathematics. In particular, students with higher achievement scores will:
    a. Have greater interest in mathematics.
    b. Have greater interest in taking more mathematics.
    c. View mathematics as an open system.
    d. View mathematics as a subject most students can learn.
    e. View mathematics as an increasingly central subject for occupations and for the development of society.
2. In all countries, in the 13 year old populations:
    a. There will be no differences in overall mathematics achievement between boys and girls.
    b. There will be slight differences favoring the girls on highly verbal problems.
    c. There will be slight differences favoring the boys on computational problems.

3. Students who plan to go on to higher education or have aspirations for higher education will perform significantly better on the mathematics test than students who do not have such plans or aspirations, even when the level of mathematics instruction is held constant.

4. Students planning or desiring to enter vocations in which mathematics is relevant would have higher mathematics scores than students with other vocational plans or desires, even when level of mathematics instruction is held constant.

C. School Environment

1. The level of mathematics achievement at age 13 is not related to the age at which compulsory schooling begins.

2. The mean level of achievement in a school will be related to the total enrollment at the school.

3. The level of mathematics achievement is not related to size of class.

4. The level of mathematics achievement for students will be higher and the variability lower in specialized schools than in comprehensive schools.

5. When level of mathematics instruction is held constant, inquiry-centered approaches to learning will produce higher and less variable scores in mathematics than will more traditional approaches.

6. When the opportunity to learn mathematics is held constant, scores on the mathematics test will be related to students' descriptions of mathematics teaching and school learning.

7. Total mathematics scores will be related to the teachers' perception of the students' opportunity to learn the mathematics involved in the test items.

8. When level of instruction is held constant, the total mathematics score will be higher in schools where teachers feel themselves to have greater freedom in determining what will be taught and how it will be taught.

9. Students whose teachers have had recent (within 5 years) in-service training in mathematics will:

    a. Have higher total mathematics scores than students studying under teachers who have not had such training.

    b. Be more inclined to view mathematics as an open system.

    c. Have greater interest in mathematics.
    d. Describe mathematics teaching as emphasizing inquiry.
    e. View mathematics as increasingly central for occupations and the development of society.

10. When the level of teachers' training is held constant, mathematics achievement will be directly related to the amount and the quality of the preservice training of the teachers.

11. When level of instruction is held constant, the total mathematics score will not be related to the number of hours of schooling per week.

12. When the level of instruction is held constant, the achievement of students will be related to the number of hours per week given to mathematics instruction.

13. When the level of instruction is held constant, the achievement of students will be related to the number of hours per week devoted to mathematics homework.

14. When the level of instruction is held constant, the relationship between the number of hours per week devoted to all school homework and the lower mental processes scores will be higher than the relationship between the number of hours per week devoted to all school homework and the higher mental process scores.

15. Mathematics achievement will be highest among students who have participated in "special opportunities" offered students.

16. Students who have had courses in "New Mathematics" will have higher scores than other students on items in traditional mathematics.

17. Performance on the mathematics test will be related to per-student financial expenditure as a whole and specifically, teachers' salaries.

18. Differences between boys and girls in mathematics achievement, interest in mathematics, plans for further mathematics, and attitudes about the difficulty of learning mathematics will be least in coeducational schools, while they will be greatest in single-sex schools.

D. Community Environment - Countries

1. The mathematical achievement of each country is related to the mean age of the students forming the population within that country.

2. Students at the 13-year-old level will have more favorable interests in mathematics in schools and countries which emphasize comprehensive and nonselective secondary education.

3. The average level of mathematics achievement in both of the terminal groups will be lower in countries with larger percentages of the age group still in school.

4. When equal proportions of the total age group are compared, countries will not differ in the terminal level of mathematics achievement.

5. In countries retaining larger proportions of an age group in school, higher levels of mathematical achievement will be attained by a smaller proportion of those still in school but by a larger proportion of the total age group.

DESIGN OF STUDY:

1. Cross-national survey.

2. Four-year period from June, 1961 to December, 1965.

3. Actual test construction of instruments began in March, 1962 and the cross-national testing was accomplished between January and June of 1964. Instruments were administered one time only.

DESCRIPTION OF THE SAMPLE:

1. Population:

   a. Countries: 12 countries were included in the study, as follows: Australia, Belgium, England, Finland, France, Germany, Israel, Japan, The Netherlands, Scotland, Sweden, and the United States. Within each country four types of samples were obtained based upon both experience with and type of mathematics instruction. These samples are described in detail in the section below.

   b. Each of the four types of samples described below was tested in every country included in the study. The broad categories of students were distinguished and labeled "Population 1" and "Population 3". Population 1 includes all students studying in institutions not primarily concerned with the goals of college or university preparation. Population 3 included those schools "from which university or equivalent institutions of higher learning normally recruit their students". Each of these two groups were subdivided as follows:

Population 1a: All pupils who are 13.0 - 13.11 years of age at the date of testing

1b: All pupils at the grade level where the majority of pupils of age 13.0 - 13.11 are found

3a: All pupils "studying mathematics as an integral part of their course"

3b: All pupils "studying mathematics as a complementary part of their studies

2. Sampling procedure: a two-stage probability sampling procedure was used.
   a. A random sample of schools in each population described for each participating country was drawn.
   b. Within each school selected, a random sample of students was selected.
   c. Countries eventually participating in the study were those expressing an interest in such research by sending representatives to the UNESCO Institute of Education Assemblies. The basic sampling problem was that of securing a representative sample of age and grade level groups in each country.
3. Size of sample:
   a. The range of schools sampled was from 8 schools in France to 395 schools in the United States.
   b. The range of the number of students was from 50 students (one of the four samples in the Netherlands) to 6,544 students in the United States.

   Approximate numbers:

   150,000 students
   13,000 teachers
   5,300 headmasters
4. Sex: approximately equal numbers of males and females with the exception of population 3a which consisted of 75% males.
5. Racial composition: not reported.
6. Religious composition: not reported.

INSTRUMENTS AND MEASUREMENTS:

All of the instruments used in this study were developed by the research team specifically for this study.

1. The International Project for the Evaluation of Educational Achievement (IEA) Mathematics Test designed to measure student aptitudes and abilities in the following content areas:
   a. Basic and advanced arithmetic
   b. Elementary and intermediate Algebra
   c. Euclidian and Analytic Geometry
   d. Sets, Trigonometic and circular functions
   e. Analysis, Calculus, Probability, Logic and Affine Geometry
2. The Student Opinion Booklet, designed to determine:
   a. Student's description of mathematics teaching and learning
   b. Student's description of school and school learning
   c. Student's attitudes toward mathematics as a process; difficulties in learning mathematics; and the place of mathematics in society.
3. Student Questionnaire (STQ), designed to measure:
   a. Student personal characteristics
   b. Student interests and future educational and vocational plans.
4. Teacher Questionnaire (TCHQ), designed to determine:
   a. Teacher experience, training and views
   b. Teacher ratings of the relevance of the IEA Mathematics test for their students
5. School Questionnaire (SCHQ) for School Administrator or Headmaster, designed to obtain information regarding:
   a. The type of school
   b. Practices of the school
   c. School personnel
   d. School financial situation

6. The National Information Questionnaire (NATQ), responded to by an expert on the educational system of each country, designed to gather qualitative and quantitative data on the structure of the educational system of that country.

VARIABLES STUDIED:

1. Student Variables:
    a. Aptitude and ability in:
        (1) Basic and advanced mathematics
        (2) Algebra
        (3) Geometry
        (4) Trigonometry, Calculus, Probability, Logic and Affine Geometry
    b. Student's perceptions of mathematics teaching and learning
    c. Student's descriptions of school
    d. Student's attitudes toward mathematics as a process and the place of mathematics in society
    e. Student's attitudes: difficulties in learning mathematics
    f. Student's interests and educational and vocational aspirations
    g. Personal characteristics (e.g., age, sex)
2. Environmental Variables - Family
    a. Socioeconomic level measured by level of Father's occupation and parents' level of education
    b. Place of residence (e.g., urban, rural)
3. Environmental Variables - School
    a. Type of school (e.g., selective, comprehensive, non-coeducational)
    b. General practices of the school (e.g., using inquiry-centered techniques, age of initial enrollment)
    c. School finances (e.g., per-pupil expenditure, teacher salaries)
    d. Teachers' experience, training and attitudes toward their school and teaching

4. Environmental Variables - Community (Country)

   Structure of the educational system of the country (e.g., comprehensive, selective)

STATISTICAL PROCEDURES:

1. Descriptive statistics including central tendency and variability indices
2. Frequency distributions
3. Item analyses including difficulty and discrimination indices
4. Univariate 7 ratio comparisons
5. Correlation matrices
6. Multiple regression analyses

MAJOR FINDINGS:

I. Educational Development

   A. Family Environment

      1. When the level of instruction was removed, the place of parents' residence (urban, town, rural) was, in general, not significantly related to mathematics achievement.

      2. Although the relationships were significant in a few countries, financial support was not a major factor associated with student achievement in mathematics.

      3. The hypothesis that there will be a systematic difference in socioeconomic status between students in populations 1 and 3 was confirmed with the exception of the United States students enrolled in pre-university non-mathematics programs.

      4. The relationship postulated between high mathematics interest scores and high status Father occupation was confirmed.

   B. Personal Characteristics

      1. In each population, males achieved at a higher level than females, even when the level of mathematics instruction was held constant. Boys were consistently superior whether the problems were verbal or computational in form.

2. Educational plans and aspirations were related to mathematics scores in almost all countries for Populations 1b, 3a, and 3b.

   In general, plans or desires to enter scientific and technical occupations were related to mathematics scores although the relationships were neither very high or consistent.

3. Interest and attitudes toward mathematics were related, in all populations, to the total mathematics scores.

C. School Environment

1. In school systems admitting pupils at the age of 6, students obtained mathematics scores at age 13 which were superior to those obtained by students in systems admitting children at age 5 or age 7.

2. Within the range of school sizes, the best performances in mathematics by students in Population 1 (those who were 13.0 - 13.11 at the time of testing) were in schools with enrollments exceeding 800. Evidence was inconclusive with students in Population 3 (In Population 3, university oriented schools, the students were often older than 13 in some countries).

3. In the majority of cases, regardless of whether the system was comprehensive or selective, the size of class was not related to mathematics achievement.

4. Specialization (restriction of the number of subjects studied in the pre-university years) was not associated with higher mathematics scores.

5. Evidence supportive of the hypothesis that level of mathematics achievement will be higher and variability lower in specialized schools than in comprehensive schools was inconclusive.

6. Students were found to achieve at a high level when they were in schools with some or much variability in terms of socioeconomic characteristics than they did when placed in schools that were homogeneous with regard to socioeconomic background of their fellow students.

7. The hypothesis that when school program is held constant, the total mathematics test scores of pupils of lower socioeconomic status will differ from those pupils of higher socioeconomic status was supported in all countries. A large proportion of high occupational level students was found in the academic program, whereas, low status students tended to be in general or vocational program.

8. In all populations except 3b (those studying mathematics as a complementary part of their studies), achievement in mathematics had little relationship to the number of hours per week of schooling.

9. Achievement in mathematics was related to the number of hours per week given to mathematics instruction in all populations with the strongest relationship in Population 3a (those students studying mathematics as an integral part of their course).

10. Except for Population 3a, the number of hours per week spent on mathematics homework made no appreciable difference in achievement.

11. Students who participated in classes where teachers provided "special opportunities" achieved higher mathematics scores.

12. Students who had courses in "New Mathematics" achieved higher score than other students on items in traditional mathematics.

13. There was no significant relationship between students' mathematics scores and teachers' perceptions of their freedom in teaching (assessed by the Teacher Questionnaire).

14. Hypotheses regarding recent in-service training of teachers and mathematics, interest and attitude variables produced inconclusive results since nothing was known about the type of training, its intensity or quality.

15. Mathematics achievement and amount of pre-service training of teachers were, in general, related. However, students of university-trained teachers produced insignificantly higher scores than teachers trained at teacher-training institutions.

16. For Population 1a (students who were 13.0 to 13.11 years of age at the time of testing), there was a positive relationship between high mathematics scores and the students' view of their teaching as being "inquiry-centered"; for pre-university students of Population 3a (students studying mathematics as an integral part of their course) no significant relationship was found between mathematics scores and inquiry-centered techniques.

17. Interest in mathematics was strongest in the selective schools, less strong in the comprehensive schools, and weakest in the schools for the remainder of the students after selection had operated.

18. The difference in mathematics achievement between girls and boys was greater in non-coeducational schools than it was in coeducational schools.

D. Community Environment - Countries

1. The countries with greatest emphasis on comprehensive education are those with greatest interest in mathematics.

2. When equal proportions of an age group were compared, countries differed much less among themselves than they did when the proportions actually tested in populations 3a and 3b were included in the analysis. (Both students studying mathematics as an integral part and as a complementary part of their studies).

3. The proportions of the in-school population reaching various international percentile levels were negatively related to the proportion still in school. The proportions of the total age group reaching various international levels were positively related to the proportion still in school.

E. Summary of variables related to achievement in mathematics

1. The level of math achievement was found to be positively related to

SES BACKGROUND VARIABLES

a. father's occupational level,
b. father's educational level,
c. mother's educational level,

STUDENT PSYCHOLOGICAL VARIABLES

d. sex of student (male),
e. interest in math,
f. level of educational aspiration,
g. aspiration for science or technical occupations,

STUDENT BEHAVIORAL VARIABLES

h. number of hours spent studying math in school,

EDUCATIONAL VARIABLES

i. degree of heterogeneity of SES backgrounds' of students,

j. entrance at age 6, rather than at age 5 or 7,
k. exposure to special math opportunities,
l. exposure to New Math,
m. length of time in school,
n. amount of pre-service training of math teachers,
o. amount of per pupil expenditures.

2. The level of math achievement was found to be unrelated to

SES BACKGROUND VARIABLES

a. parents' income,

STUDENT BEHAVIORAL VARIABLES

b. number of hours spent in math homework,

EDUCATIONAL VARIABLES

c. size of school, except for young students, where large schools were more conducive to achievement,
d. size of class,
e. type of program,
f. number of hours per week in school,
g. amount of perceived teacher freedom,
h. size of community -- urban, town, or rural.

3. The level of interest or motivation to excell in math was found to be positively related to

SES BACKGROUND VARIABLES

a. father's occupational level,
b. father's educational level,
c. mother's educational level,

STUDENT PSYCHOLOGICAL VARIABLES

d. sex of student (male),

EDUCATIONAL VARIABLES

e. type of community -- urban, town, or rural -- in some countries.

AUTHOR(S): Jerome Kagan and Howard A. Moss

TITLE: Birth to Maturity

PUBLISHER: John Wiley and Sons, Inc., New York, 1962

MAJOR ISSUES:

Generally, it is agreed that childhood behaviors are related in complicated ways to adult behaviors: some behaviors are sublimated or seemingly erased long before maturity; others are continuously visible; others disappear; only to reappear in adult life. Insight into this developmental code would provide important clues that would improve our ability to forecast or predict adult behavior from knowledge of childhood experiences and behaviors.

Most of the data that leads to the above general observation or hypothesis comes from retrospective sources. Adequate substantiation, however, is dependent upon systematic longitudinal studies which allow for continued observation and testing of persons from childhood to adulthood.

OBJECTIVES OF THE STUDY:

1. To study the emergence of childhood behaviors, the developmental periods during which they become manifest, and the adult responses which are related to these behaviors.
2. To determine the stability (continuing patterns of behavior) of selected motive-related behaviors, sources of anxiety, defensive responses, and modes of interpersonal interaction from early childhood through adulthood.
3. To study the stability of IQ scores and some of the correlates of change in intellectual ability.
4. To validate some of the popular tests and measures used in personality assessment.
5. To study the "sleeper" effect, that is, behaviors which may be related to early maternal practices that lay dormant during child development.

MAJOR HYPOTHESES:

I. Personal Development:

   A. There are stable patterns of relationships between adult behavior and the individual's previous behavior as a child. These can be observed and described.

   B. Family, peers, teachers, and other adults influence the child's goals and behaviors.

   C. Behaviors are the major construct by which child development should be studied. Child development refers to the continuous pattern of activities called child and adult behaviors.

   D. Selected adult motives, attitudes, and behaviors begin their growth during the first ten years of life. Once established during childhood, these responses are likely to remain permanent aspects of the individual's behavioral repertoire.

   E. There is a "sleeper" effect (time lag) between certain maternal practices and evidence of their effect in the child's behavior.

DESIGN OF STUDY:

1. Longitudinal: in progress 30 years (1929-1954), studying the first 14 years of life for each child. Follow-up of the same subjects between the ages of 19 and 29.

2. Complete longitudinal data were collected on the original sample for the first 14 years; follow-up data was completed for 71 of the original 89 (16 subjects moved away; two refused to cooperate).

3. Data collection:

   a. Longitudinal data were drawn from behavioral observations made in the home, nursery school, day camp and public school; interviews with the child, mother and teacher, ratings made on the Parent and/or Child Behavior Rating Scale.

   b. The longitudinal data and the adult interviewer ratings were completely independent of each other since the interviewer had no knowledge of any of the longitudinal information on the adult or the child at the time of the interview or observation.

c. The ratings for each of the child's four developmental periods were all made by the same person and the independence of the assessments may be questioned.

The authors state that the amount of material studied, the number of ratings made (approximately 4,500) and the interval of time between the evaluation of a specific child for two successive periods was sufficiently large to guarantee a high degree of retroactive inhibition. In addition, independent ratings of the material produced satisfactory inter-rater reliabilities.

d. Information gathering schedule:

(1) Observation of the mother and child at home gathered semi-annually during the first 6 years of life; annually from ages 6 to 12.

(2) Observation of the children at the Fels Experimental Nursery School semi-annually from ages 2 1/2 to 5; annually from ages 6 to 10.

(3) Mental testing: (see instruments)

Under age 5, intelligence tests given twice a year; after age 5, annually.

Over age 8, Rorschachand selected TAT stimuli given every third year. Other personality tests administered on a less regular schedule.

(4) Observation of the child in school semi-annually; sessions lasting half days.

(5) School grades collected semi-annually.

(6) Interviews of children from ages 6 to 14 annually and interviews of mothers annually at home or at Institute.

4. Developmental periods of children designated according to the following age groupings:

a. Period I: ages 0 - 3

b. Period II: ages 3 - 6

c. Period III: ages 6 - 10

d. Period IV: ages 10 - 14

5. Replication:

   a. A group of 45 girls and 45 boys born between 1941 and 1959, none of whom were members of the longitudinal study, was selected.

   b. 15 girls who had visited the Fels Experimental Nursery School when they were between the ages of 3 and 6 were selected.

   c. Three variables were rated: passivity, dependency, and task mastery.

   d. After replication I, the 15 girls were eliminated and 61 subjects examined.

DESCRIPTION OF SAMPLE:

1. Size of sample: 89 children from the Fels Research Institute. Adult sample: 71 of the original 89.

2. Population: It is assumed that the 89 children represented the entire enrollment of the Institute in 1929.

3. Age: birth through adulthood.

4. Sex: 45 females; 44 males.

5. Racial composition: white only.

6. Social class: Majority were middle class as judged by the father's occupation and educational level of parents.

7. Religious composition: 76.2% Protestant; 21% Catholic; 2.8% Jewish.

8. Sampling procedure: Not discussed. The assumption is made that the sample represents the entire population of the school at inception of the project.

9. Limitations of study due to sampling:

   a. Possible sources of bias:

      (1) Non-representative sample: parents with an interest in research or a desire for the prestige associated with being a part of a research project are most likely to enroll their child in such a program.

      (2) Attrition: socioeconomic factors caused some subjects to remain geographically close to the project site; others moved away.

   b. Results are not generalizable in that no verification procedures were used to determine if sample characteristics were representative of the general population.

INSTRUMENTS AND MEASUREMENT:

1. Child Assessment:

   a. Observation of Mother and Child: summarized on the Fels Parent Behavior Rating Scale devised by staff to measure the following observed behaviors and interactions of the mother and subject as a child.

      (The specific behavioral referents used in rating the variables varied for the different age periods, e.g. aggression to mother for Period I was expressed in the form of a tantrum; for Period III, verbal aggression to mother and disobedience were behavioral indices of aggression).

      (1) Dependence: (goal of behavior is affection or assistance)

      (2) Aggression: (goal of behavior is psychological or physical injury to a person or person surrogate)

      (3) Achievement: (goal of behavior is self-approval for performing tasks--intellectual, athletic, mechanical, and artistic abilities--at a level of competence previously established as satisfying)

      (4) Recognition: goal of behavior is some positive reaction from other people--a social acknowledgement of the individual's skills.

      (5) Heterosexual behavior: amount and kind of interaction with members of the opposite sex

      (6) Fear of Physical Harm

(7) Quality of social interaction: the degree of spontaneity or inhibition that accompanies interaction with others.

(8) Passive withdrawal: degree to which the subject acquiesced or withdrew in the face of attack or frustrating situations, in contrast to an active attempt to overcome and deal with environmental frustrations.

(9) Sex-role interests: traditional sex-typed interests and behaviors--a measure of the construct of sex-role identification.

(10) Compulsivity: compulsive habits such as ritualistic attempts at order and cleanliness.

(11) Nurturance: the attempt to help, encourage, and display concern for the welfare of others.

(12) Hyperkinesis: the inability to inhibit impulses to action, especially uncontrolled aggressive outbursts.

b. Narrative summaries describing the interaction and behaviors of mother and subject as a child.

c. Stanford-Binet Intelligence Test designed to measure level of conceptual development (IQ) administered semi-annually from ages 2½ to 5; annually from ages 5 - 12.

d. Gesell Developmental Schedule designed to measure mental development administered at 6, 12, 18, and 24 months.

e. Merrill-Palmer Infant Test administered at 18, 23 and 30 months.

f. Primary Mental Abilities administered at age 17, designed to measure general intelligence.

g. Otis IQ Test: designed to measure mental development (IQ) of Mother and Father.

h. Wechsler-Bellevue Scale (Form 1) designed to measure mental development (IQ) at ages 13 and 17.

2. Adult Assessment:

a. Adult Interview: designed to measure the same variables of aggression, recognition and achievement, etc. as was measured in the subject as a child.

b. Tachistocopic Recognition Task: designed to measure ease versus difficulty in the recognition of potentially conflictful behavior.

c. Autonomic changes: measures of heart rate and Palmar resistance designed to measure anxiety and conflict.

d. Modified Rorschach Ink Blot Stimuli: designed to measure conceptual style.

e. Thematic Apperception Test: designed to measure personality development (also used in adolescence)

f. Self-rating Inventory: developed by authors and designed to measure motives, attitudes and overt behaviors related to dependency, aggression, physical harm, sexuality, compulsivity, recognition, and relation to peers.

g. Figure Sorting Task: stimuli taken from the Shneidman Make-A-Picture Story Test designed to measure preferred conceptual style of child and adult.

h. The French Insight Test: designed to measure achievement and affiliative preoccupations.

i. Wechsler-Bellevue Adult Intelligence Scale: (Form I) designed to measure intelligence.

j. Hanfmann-Kasanin Concept Formation Test: designed to measure conceptual style.

k. Self-rating Scale devised by authors designed to measure a variety of behaviors (e.g., fear of bodily harm, etc.)

FOUR CLASSES OF VARIABLES

The following classes of variables were studied in order to classify overt behavior.

1. Motive-related behaviors: Motives are defined as learned desires for specific goal states and behaviors studied are those related to the desire for social recognition, task mastery, nurturance and affection, sex-appropriate interests, sexual gratification, affiliation with peers, and perception of a state of inquiry or anxiety in others (aggression).

2. Sources of anxiety: Anxiety is defined consensually as an unpleasant, affective state.

3. Anxiety as a motive for defensive behaviors: Anxiety has motivational properties as it elicits responses aimed at a specific goal, in this case, diminution of the unpleasant feeling state. These learned responses have been called defenses which refer to covert thought sequences such as repression, and also overt reactions that are attempts to reduce anxiety.

4. Social interaction: The tendency to approach or to avoid social objects, the degree of spontaneity or tension in social interaction and the tendency to dominate or submit.

VARIABLES

A. Passive and Dependent Behavior - Child

1. Passive reaction to frustration (rated for all four periods)
    a. Periods I, II, - retreat when dominated by sibling, no reaction when goal object lost, withdrawal when blocked from goal by environmental obstacle and withdrawal from mildly noxious or potentially dangerous situations.
    b. Periods III, IV - withdrawal from attack or social rejection, withdrawal from difficult and frustrating task situations.
2. Dependence on female adults
    a. Periods I, II - general dependent tendencies toward female adults (primarily the Mother) - seeking of affection, requests for instrumental aid, and reluctance to be separated from the adult.
    b. Periods II, IV - seeking of affection, acceptance, and emotional reassurance from adults; seeking of assistance in problem situations.
3. Independence
    a. Periods II, III, IV - the occurrence of independent behaviors in threatening and problem-solving situations.
4. Anxiety over loss of nurturance
    a. Periods I, II, III - behavioral signs of anxiety (e.g. crying, protest, emotional upset, etc.) when a source of nurturance was withdrawn, or when the child anticipated a loss of love or support from parent or parent figures.

A. Dependent Behavior - Adult

1. Dependence on love object - degree to which subject viewed his love object as a reliable source of support and advice.

    a. Reluctance to make decisions without consulting love object.

    b. Perception of love object as wiser and more stable than the subject.

    c. Feeling that the subject relied on the love object's reassurance and guidance in crisis situations.

2. Dependence on parents - degree to which subject sought parents as sources of advice, financial support, and encouragement.

    a. Parents used as source of advice

    b. Frequent visits and phone calls

    c. Reluctance to move away from parents

3. Dependence on parent substitute figures and friends.

    a. The seeking of advice from teachers, coaches, college pals, bridge partners, and neighbors, etc.

4. Withdrawal from stressful situations

    a. Adult's tendency to withdraw from situations which were viewed as tests of competence or from situations in which the subject expected task failure or social rejection.

5. Conflict over dependency

    a. Derogatory statements about dependent people

    b. Refusal to be dependent or passive with another person

    c. An unwillingness to admit to dependent motivation

6. Dependency and vocational choice

    a. Concern with financial security

    b. Avoidance of risk in occupational choice

B. Aggressive Behaviors - Child

1. Aggression

Periods I, II, III, IV - behavioral manifestations of direct hostility toward the mother (flagrant disobedience, verbal attacks), chronic resistance to maternal requests.

2. Physical aggression to peers :

   Periods I, II, III - the occurrence of unprovoked, physical attacks on the same sex peers.

3. Indirect aggression to peers :

   Periods I, II, III, IV - occurrence of unprovoked nonphysical aggression toward the same sex peers (teasing, destruction or seizing of peer's property)

4. Behavioral disorganization :

   Periods I, II, III, IV - degree of behavioral disorganization displayed by the child when he encountered frustration or attack; tolerance for frustration.

   1. Periods I, II, - violent crying and tantrums

   2. Periods III, IV - uncontrolled destructive activity, rages, and tantrums

5. Conformity to adults :

   Periods I, II, III, IV - degree of obedience to parents and teachers and the tendency to enforce adult rules with other children

6. Dominance of peers :

   Periods II, III, IV - child's attempt to direct and control the behavior of other children.

7. Competitiveness :

   Periods II, III, IV - the degree to which the child became involved in games or tasks that were tests of relative superiority and competed with peers for superiority in any task.

B. Aggressive Behavior - Adult

1. Aggressive retaliation - individual's tendency to retaliate with direct verbal aggression or blatant resistance when attacked, teased, frustrated, or restricted by the social environment.

2. Ease of anger arousal - the interviewer's evaluation of the individual's threshold for anger, the ease with which mild

frustration led to irritability and anger.

3. Competitive behavior - involvement in competitive activities.

4. Aggressive conflict

    a. Aggression anxiety - person's reluctance to express overt aggression due to fear of disapproval, rejection, or guilt.

    b. Repression of aggressive thoughts degree to which the subject was unaware of angry feelings or thoughts and denied these feelings especially in situations where such motivation was appropriate.

5. Criticism of parents - degree to which subject entertained conscious attitudes of disappointment or resentment toward the values, behavior, or personality of his parents, and his willingness to disclose this material; a measure of conscious hostility toward the parent.

C. Achievement and Recognition Behaviors - Child

1. General achievement - mastery behaviors

    a. Period 1 - persistance with perceptual motor activities (e.g. building block towers, stringing beads, coloring, and drawing).

    b. Period II, III - interest in and persistence with intellectual, mechanical, and athletic activities.

    c. Period IV - intellectual, mechanical, and athletic tasks.

2. Intellectual achievement - child's attempt to master language and numerical skills, his motivation to perform well in the school situation, his involvement in knowledge acquisition, amount of time spent in reading, and interest in scientific projects.

3. Mechanical achievement - child's attempts to master mechanical skills, for example, carpentry, mechanical toys, motors, and arts and crafts.

4. Athletic achievement - degree to which the child showed involvement in physical skills and the time spent in athletic activities.

5. Recognition behavior:

    Periods III and IV - child's desire for status goals and social recognition and intensity of his behavioral efforts to obtain these goals.

6. Competitiveness:

   Periods II, III, IV - degree to which child competed with peers for superiority in any task.

7. Expectancy of task failure:

   Periods III, IV - degree to which the child anticipated failure in challenging task situations (statements of inadequacy to parents and sign of avoidance of leadership position, achievement related situations with peers, academic recognition and athletic honors)

8. General withdrawal:

   Periods II, III - degree to which the child avoided situations in which he anticipated task failure or social rejection.

9. Withdrawal from task situations:

   Period IV - withdrawal from task situations in which the child anticipated failure.

10. Intelligence:

    Period I, II, III - average of three Stanford-Binet scores.

C. Achievement and Recognition Behavior - Adult

1. Achievement behavior:

   a. Assessment of behavioral strivings for task mastery

   b. Subject's desire for competence in various skill areas (i.e. achievement motivation) independent of his behavioral attempts to obtain these goals.

2. Recognition behavior:

   Adult's desire for status and social recognition independent of his behavioral attempts to obtain these goals. (Goals included academic honors, striving for leadership positions in organizations, and vocational choices that had high status characteristics scientist, doctor, lawyer, etc.)

3. Concern with intellectual competence:

   How important education, cultural sophistication, curiosity, and acquisition were in his value system.

4. Fear of failure and withdrawal from potential failure situations:

   Individual's feelings and reactions in key problem situations (college, work, reasons for vocational choices, apprehension about assuming positions of responsibility, confidence in decisions about the family and major purchases; and anxiety in social situations in which the subject felt he might be judged negatively ).

5. Intelligence:

   Score on Full-Scale Wechsler Intelligence Scale (Form 1)

D. Sexuality- Child

1. Heterosexual behaviors:

   Period III, IV - frequency and quality of interaction with numbers of the opposite sex (particularly dating behavior)

2. Heterosextual interaction:

   Period III, IV - frequency and quality (type) of interaction with members of the opposite sex.

3. Opposite sex activity:

   Periods II, III, IV - child's interest in and practice of activities that are traditionally associated with the opposite sex (i.e. interest in athletics, mechanical objects, and highly competitive activities were regarded as masculine; involvement in gardening, music, cooking, and noncompetitive activities viewed traditionally as feminine ).

E. Social Interaction Anxiety

1. Anxiety with the Fels visitor:

   Period I, II - assessed anxiety in presence of the Fels home visitor (crying when the visitor arrived, withdrawal or freezing, and seeking proximity to mother or a familiar adult ).

2. Anxiety in novel situations:

   Period I, II - assessed anxiety (same anxiety criteria as above) when the child was in a novel situation (visits to Fels for examinations, initial visits to the nursery school, or entrance into elementary school ).

3. Social Spontaneity:

   Period I, II, III, IV - child's responsiveness and affective ease with peers and adults (smiling, eagerness to interact) in contrast to signs of inhibition and shyness in interpersonal situations.

4. Expectancy of peer rejection:

   Period III, IV - evaluated behavior which suggested that the child anticipated rejection from peers. (statements that peers do not like the subject, absence of friends, manifestation of reserve and constriction with peers was included in Period IV only)

5. Withdrawal from social interaction:

   Period I, II, III, IV - child's tendency to withdraw from social situations with peers (reluctance to attend peer functions, remaining on the sidelines in group situations).

F. Compulsivity:

Periods I, II, III, IV - child's concern with neatness, cleanliness, order in his environment and preciseness in working with materials.

G. Nurturance:

Period III, IV - the degree to which the child spontaneously gave assistance, sympathy or showed concern for siblings or peers when the latter had difficulty in a task or requested help or comfort.

D. Sexuality - Adult:

1. Avoidance of premarital sexuality:

   Assessed subjects reluctance to establish heterosexual relationships during late adolescence and early adulthood and the degree of inhibition placed on erotic behavior (necking, petting, coitus).

2. Sex anxiety:

   Anxiety over anticipation or commission of sexual behavior.

3. Repression of sexual ideas:

   Denial of sexual thoughts and absence of any conscious concern with sexual gratification.

4. Opposite sex interests:

The degree to which the adult's current activities were masculine or feminine in nature (see childhood variables for more detail)

E. Social Anxiety

Degree of tension and discomfort the individual experienced in social situations; the degree to which he approached interaction with strangers with caution and apprehension due to an expectancy of rejection.

F. Compulsivity

The subject's need for order in his possessions, his tendency to be unusually neat in the organization of his clothes, tools, records, financial receipts, etc.

G. Impulsivity

The degree of impulsivity in contrast to caution and vacillation, in decision-making situations (e.g. choice of college and career, major purchases).

H. Physical Harm Anxiety - Child

Anxiety over bodily harm:

Period I, II - degree of apprehension over possible injury, sickness, or bodily harm.

Fear of and avoidance of cars, animals, the dark, and activities that were potentially dangerous; avoidance of dangerous play (jungle gym, climbing, wrestling) and presence of irrational fears such as the dark, animals, etc.

2. Irrational fears:

Periods III, IV - assessed the intensity and frequency of irrational fears and phobias (e.g. the dark, strange animals, large objects);the occurrence of nightmares, and excessive concern with the health and illness of self and others ).

3. Avoidance of dangerous activity:

Period III, IV - child's avoidance of games and activities that involved the risk of physical injury (e.g. contact sports, climbing, swimming).

I. Hyperkinesis :

Period II to IV - reaction to minimal tension with immediate motor discharge and restlessness.

J. Introspectiveness :

Period IV - individual's ability and willingness to discuss motives, goals, conflicts, and source of anxiety during the interview sessions.

Adult

J. Introspectiveness: subject's skill and willingness to discuss his goals, affect states, and sources of anxiety.

ENVIRONMENTAL VARIABLES

A. Social Class

Defined by level of education of parents

B. I.Q. of Parents

C. Maternal Practices

1. Maternal protection : degree to which the mother rewarded dependent overtures and prevented independent development.
    a. Unsolicited and unnecessary nurturance of the child
    b. Consistent reward of child's requests for help and assistance
    c. Encouraging the child to become dependent on her
    d. Over concern when the child was ill or in danger
2. Maternal restrictiveness:
    a. Assesses mother's attempts to force the child through punishment or threat to adhere to her standards; the degree to which she punished these deviations
    b. Punishment for any deviation from maternal standards and channeling the child into activities the mother valued, without any regard for his abilities or interests.

3. Maternal hostility:

   Maternal criticism of the child and hostile statements expressed directly to the child or to other adults

   1. Criticism of child's behavior by derogation of his skills and personality

   2. Statements of preference for another sibling

   3. Active rejection or neglect

4. Maternal acceleration:

   a. Degree to which the mother showed excessive concern for the child's cognitive and motor development and her tendency to place excessive expectations on his level of achievement.

   b. Degree to which the mother pushed the child's developmental level beyond his abilities and concern for his achievement level.

      1. Concern over the age when the child talked, walked, rolled over

      2. Showing off of child's cognitive development

      3. Maternal dissatisfaction with the child's cognitive development

      4. Maternal encouragement of the child to master various skills

STATISTICAL PROCEDURES:

Inter-rater reliabilities based on:

1. Product moment correlations

2. "Essential percentage of agreement": defined as the ratio of the number of instances in which the two raters agreed within one point of each other (agreements) to the total number of arguments plus disagreements.

   Ratings were only made when the rater felt the data were sufficient to make a confident evaluation. Stability correlations are not presented where the sample of boys or girls fell below 10, and were not uniform between age periods. A significant degree of stability was obtained only for certain variables, sometimes for only one sex and not the other.

3. For each of the behavior clusters, interview ratings were correlated with corresponding longitudinal variables for each age period. These coefficients provide a profile of the predictive power of childhood behavior for different developmental periods.

MAJOR FINDINGS

I. Personal Development

A. Passive and Dependent Behavior in Adulthood

1. For girls, a degree of passivity and dependency during Periods III and IV are associated with:

   a. A passive and dependent relationship with their love object (husband, boyfriend; r= .35)

   b. Dependency on their parents (r= .47)

   c. Withdrawal as adult women (r= .67)

   d. Minimal conflict over dependency as adults

   e. Concern for husband's and own job security

2. For boys, passive and dependent behavior showed moderate stability over the first ten years, but predictability of adult responses was poor.

3. Passivity and dependence in early childhood was not significantly associated with educational level of child's parents. Adult dependency in men was significantly associated with maternal education and dependency on love object; for women, paternal educational level was inversely related to love - object dependency.

4. Passivity during the first three years was significantly associated with a consistent cluster of school-age behaviors (ages 6 to 10).

   a. Avoidance of dangerous activity

   b. Absence of physical and verbal aggression

   c. Conformity to parents

   d. Timidity in social situations

5. Boys who were passive during Period I:

   a. Avoided sports and traditional masculine activities

   b. Chose intellectual careers (music, physics, biology, psychology)

   c. Displayed minor degree of spontaneous cardiac arrythmia

B. Aggressive Behavior in Adulthood

1. For males, degree of aggression to Mother, behavioral disorganization and dominance for Periods III and IV were associated with:

| | Period III | Period IV |
|---|---|---|
| a. Adult aggressive retaliation | r= .32, .37, .44 | .47, .51, .48 |
| b. Adult anger arousal | r= .37, .30, .25 | .77, .42, .47 |
| c. Adult competitiveness | .36, .34, .59 | |

2. For women, there was no relationship between aggression to Mother, behavioral disorganization and adult behavior; and a negative relationship between peer aggression and adult behavior.

3. For males, adult competitiveness was associated with:

| | Period III | Period IV |
|---|---|---|
| a. Indirect aggression to peers | .56 | .51 |
| b. Physical aggression to peers | .46 | |
| c. Aggression to Mother | .36 | |
| d. Behavioral disorganization | .34 | .59 |
| e. Competitiveness | .51 | .39 |

   For girls, only childhood competitiveness predicted adult competitive behavior (r= .52).

4. Adult aggression anxiety for both men and women was predicted by absence of aggression to Mother and a high degree of conformity during Period III (r= .36 pooled); there was no relationship between childhood aggression or conformity to the Mother and criticism of the Mother.

C. Achievement behavior during childhood was significantly related to:

a. Achievement in adulthood (r= .37 pooled)

b. Adult's desire for status and social recognition (for men, r= .82; .98 for women)

c. Intellectual mastery and excellence as adults (for men, r= .66; .49 for women)

d. Withdrawal in childhood and fear of failure (for females r= -.34; -.40)

e. Strong fear of bodily harm during Period II for males (r= .50); for women a negative correlation between avoidance of dangerous activity during Period III and intellectual orientation (r= -.63)

f. Achievement behavior and intellectual mastery during childhood and adulthood highly correlated with I.Q. for both males and females

| | | | |
|---|---|---|---|
| boys | .57 | girls | .77 |
| adult men | .51 | adult women | .68 |

g. Adult concern with intellectual competence and general achievement highly correlated with parental educational level.

| | | Boys | | Girls | |
|---|---|---|---|---|---|
| | Period | Father | Mother | Father | Mother |
| Achievement | III | .39 | .37 | | |
| | IV | .71 | .54 | | |
| | Adult | .64 | .55 | .68 | .63 |

D. Sexuality, Social Interaction

1. For males, failure to adopt masculine behavior during Periods I and II was predictive of high sex anxiety (r= .61); for girls, sex-role interests were not highly related to adult sexual anxiety.

2. Inhibition and apprehension with peers during early school years was predictive of social anxiety in adulthood for both sexes (men r= .65; women .54).

3. Passivity in boys during Periods I and II was highly related to:
    a. Non-masculine interests as adults (r= .44)
    b. Noncompetitiveness (r= .58)
    c. Avoidance of sexual behavior (r= .57)
    d. Apprehension in social situations (r= .46)

E. Stability of Maternal Variables

1. The four maternal behaviors (protection, restriction, hostility and acceleration) were not predictive of adult dependency.
2. Maternal protection of boys during Period I was highly correlated with:
    a. Child and adult intellectual achievement

| | |
|---|---|
| Period IV | r= .76 |
| Adult | .42 |

    b. Non-masculine sex-role interests in boys (r= .40)
3. Maternal hostility toward girls during Period I together with acceleration during Period IV were associated with adult intellectual mastery in women.

F. Findings from replication:

1. Girls who were rated as passive during Period I were, during pre-school years, non-dominant with the same sex peers and socially withdrawn.
2. Girls who were passive during 0 - 3 continued to be passive during pre-school years. For boys, rating of early dependency was the better predictor of pre-school passivity and dependency.

CONCLUSIONS:

1. The continuity between child and adult behavior generally became manifest during the first four years of school; contact with the school and peer environments during these years (ages 6 - 10) crystallize behavioral tendencies that are maintained through adulthood.

   The poorer predictive power of behavior during the preschool years suggests that developments during the age period 6 - 10 induce important changes in the child's behavioral organization.

2. Consistently high correlations between IQ and achievement behavior (stability) may be due to the fact that achievement is a socially approved behavior or at least a behavior that is not punished by the social environment.

   Secondly, mastery behavior often leads to status, acceptance by parents and parental surrogates, material rewards, as well as personal satisfaction and inner feelings of adequacy and competence.

3. When a behavior is congruent with the traditional definition of sex-appropriate behavior, it is likely to be predictive of phenotypically similar behavior in adulthood. When it conflicts with traditional sex-role standards, the relevant motive is more likely to find behavioral expression in derivative or substitute responses that are socially more acceptable.

4. Many phenotypically similar behaviors may be of different psychological significance for males and females. For example, aggressive behavior with peers is probably a more accurate index of hostile motivation in girls than in boys since traditional sex-typed values regard some forms of aggression as a critical attribute of masculinity.

   Sex difference in the stability of independence is probably the result of the differential cultural expectation for independence in males and females (e.g., culture maintains a more permissive attitude toward independence or dependence in females; but for males, independence is linked with the traditional masculine prototype).

   For example, boys who were dependent during preschool years tended to shift toward greater independence when they reached school age, reducing the stability of this behavior.

   Lack of continuity of dependency in males is due to the development of conflict over passive and dependent behavior. Both the treatment by significant others which encourages independence and autonomy and the boys' models (heroes) who symbolize independence help develop conflict over a passive orientation.

5. Sex differences in intercorrelation patterns obtained from test scores (e.g., perceptual performance, projective tests, etc.) that are not related directly to sex-typed behaviors suggest that data for males and females should not be pooled without first examining the data for sex differences.

    This means more than merely computing means and standard deviations, since many of the variables showed no significant differences in these two parameters but yielded different patterns of intercorrelations. If the data had been pooled, many of the relationships between child and adult behavior would have been negligible since the positive correlation for one sex would have been diluted by the zero order relationship for the other.

6. Early passivity (during the first five years) influences salient aspects of the child's future development. Whether this tendency is the complete product of early learning or partly the indirect consequence of constitutional factors (e.g., an association between passivity and low muscle mass during first three years) is a question that remains to be answered.

7. In psychological development, the effects of specific early experiences are often not evidenced for long periods of time--there is a time lag or "sleeper effect" between cause and effect. For example,

    a. Passivity and fear of bodily harm for age 0 to 3 and the related variable of minimal hyperkinesis for age 3 to 6 were each better predictors of love-object dependency in adult men than later assessments of these childhood variables.

    b. Selected maternal practices during the first three years of life were more sensitive indexes of the child's pre-adolescent and adult behavior than evaluations of "similar" parental practices in later childhood.

    The reciprocal nature of the Mother-child interaction changes with time: the child's stimulus salience (i.e., his ability to provoke relatively permanent changes in specific maternal reactions toward him) increases with age.

    A Mother typically establishes expectations as to what her child should be like, the standards to which his behavior should conform. The greater the discrepancy between her expectations and her evaluation of the child's behavior, the greater the likelihood that she will modify her behavior or exert pressure on the child in an attempt to direct him toward greater congruence with her expectations.

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MAJOR ISSUES:

Students undergo many maturational changes during the college years. These changes involve their feelings about leaving home, their quest for independence, social and sexual role changes, uncertainties about future careers and often loneliness and fright concerning the future. The college environment also produces great stress in students. Some students can utilize the opportunities and even the obstacles which confront them with positive outcomes. Other students cannot continue to function under all the demands and constraints they perceive. Still others are so passive that they are almost totally unaware of these stresses.

Higher education seldom gives the student sufficient opportunity and guidance for the development of the non-intellective aspects of his character. This issue is of major significance since it may well be that effective cognitive higher education depends upon the success with which a student is able to cope with the maturational changes which confront him during the college years.

OBJECTIVES OF THE STUDY:

General Objective:

1. To determine the extent and nature of personality change during the college years.

2. To determine the influence of the college environment and peer group pressures on student development.

3. To describe and publish the findings with the hope that they will bring about structural changes in higher education such that the college experience will more closely approximate the goals and needs of today's students.

Specific Objectives:

1. To discover what factors students describe as having the greatest impact on their change or development during college.
2. To determine the relative importance of academic and non-academic experiences in producing change.
3. To identify students' major regrets about their college experience, i.e., what they most wish would have been different.
4. To determine the effects of peer group affiliations on intellectual development.
5. To investigate students' reactions to grading practices as they affect learning and intellectual curiosity.
6. To document the differences in methods by which students learn, their motivation of learning, and the interplay between choice and coercion in career decisions.
7. To develop a student classification system sufficiently sensitive to be useful in curriculum counseling and modification to allow different types of students different ways of learning.
8. To collect data on the non-academic aspects of student life such as emotional development, housing preferences, drinking behavior, impulse to break rules, and need for psychiatric help.

MAJOR HYPOTHESES:

Few hypotheses were explicitly stated in this report; the following represent major assumptions and expectations.

I. Educational Development:

A student's growth potential is all or partially blocked if his interests are not appropriately related to course objectives.

II. Personal Development:

A. At least one-fourth to one-third of the students would experience several conscious identity crises in their relations to themselves, their parents, peers, and authorities which would eventuate a redefinition of the student's character which would probably occur by the time of graduation.

B. Most pre-college friendships would have more or less ended by the senior year of college.

C. Physical sexual activity alone is not strongly desired by college students compared to their needs for love and affection.

D. Personal and educational development are achieved according to the extent to which a students impulses support his strivings for competence rather than distract him from his rational aims.

III. Vocational Development:

Students would proceed in a fairly straightforward fashion from having a rather vague idea of occupational goals as freshmen to a relatively firm position by graduation.

METHODOLOGY OF STUDY:

1. Purpose: In part, the purpose of this study is descriptive of the areas and amounts of personal growth during the college years; in part, the purpose is exploratory to isolate the major factors influencing growth and constraint during this period.

2. Type of Data Collected:

   a. Survey data from questionnaires administered in the freshmen and senior years (OPI, Authoritarianism and Ethnocentrism scales and Attitudes towards Drinking scale).

   b. Interview data from biannual intensive (one to three hour) interviews of a small (n=234) subsample.

   c. Questionnaire data from a 19 page "Senior Questionnaire" derived from important factors uncovered in the intensive interviews.

3. Type of Design:

   Four year longitudinal (1961-1965) description and comparison of two highly selective universities, Stanford and the University of California at Berkeley.

4. Population:

   a. Target population: Freshmen college students in the United States.

b. Experimental population: The 1961 freshman classes at Stanford and Berkeley.

5. Sampling Procedure:

a. Institution: No sampling. Stanford and Berkeley apparently were chosen for their proximity to the researchers.

b. Students: The entire freshman class at Stanford and two-thirds of the freshman class at Berkeley.

The interview subjects (n=274) were selected at random after being classified in one of five categories on the basis of their response to the Social Maturity and Impulse Expression scales of the Omnibus Personality Inventory. One-fourth were selected from the high (+1 s.d.) Social Maturity, high (+1 s.d.) Impulse Expression scorers; one-fourth from the mean scorers on each scale; one-fourth scored low on both scales (at least 1 standard deviation below the mean); the remaining one-fourth was equally divided between high SM-low IE and low SM-high IE scores.

The rationale for this selection procedure was to study three groups of students who differed in such personality traits as flexibility, autonomy, and capacity for relationships as well as differing in their imagination and impulsivity.

6. Description of the Sample:

a. Institutions: Stanford and University of California, Berkeley.

b. Students:

(1) Total N completing the OPI questionnaire in 1961:

Stanford = 1,303; Berkeley = 2,014

(2) Number completing the Senior Questionnaire:

| | Men | Women | Total* | % Original N |
|---|---|---|---|---|
| Stanford | 272 | 212 | 484 | 37 |
| Berkeley | 262 | 239 | 501 | 24 |
| Total | 534 | 451 | 985 | |

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* the number represents 60% of those students who a) filled out the OPI as freshmen and b) were in attendance in 1965 as seniors

(3) Racial and religious composition not reported.

(4) Of the 274 subjects contacted for the intensive interviewing, final data were available on 237, or 86%; 11 had initially refused to cooperate and 26 subsequently dropped out.

7. Sample Representativeness:

The senior questionnaire respondents were compared with a random sample on"21 activities frequently engaged in during college". Since only 2 out of 24 tests were significant at Stanford and 5 out of 42 were significant at Berkeley, the samples were considered representative of the institutional populations.

It is clear, however, that the Stanford and Berkeley student populations were not representative of all college student populations, and thus the finding would at most be valid for schools similar to Stanford and Berkeley.

8. Non-respondent follow-up procedures: none reported.

VARIABLES STUDIED:

Types of Variables:

1. School environment
2. Teacher characteristics
3. Student characteristics
4. Parent characteristics
5. Peer culture
6. Faculty characteristics
7. Academic achievement
8. Academic aspirations
9. Occupational aspirations
10. Values, attitudes, goals
11. Personality
12. Extracurricular activities

INSTRUMENTS USED:

1. Omnibus Personality Inventory scales
2. Attitudes toward drinking (54 item scale by Max Levin and Mary C. Jones)
3. Strassburger Scales I and II

4. California Psychological Inventory
5. Senior Questionnaire
6. Interviews

VARIABLES AND MEASUREMENT PROCEDURES:

A. The vast majority of the data designed to assess personality development and the influences of the faculty, curriculum, peer group pressures, parental values and attitudes and the general influence of the college environment was obtained from intensive longitudinal interviews of 234 students, complimented by data on the larger sample from the Senior Questionnaire; Adorno's Ethnocentrism (20 items) and Authoritarianism (20 items) scales; the Strassburger Attitudes Toward Drinking scale; the California Psychological Inventory; and the following scales from the Omnibus Personality Inventory:

   1. SM: Social Maturity scale (144 items)
   2. IE: Impulse Expression scale (124 items)
   3. SF: Schizoid Functioning scale (107 items)
   4. MF: Masculinity-Femininity scale (103 items)
   5. ES: Estheticism scale (51 items)
   6. DS: Developmental Status scale (72 items)

B. The interview data were assembled as follows:

   1. Interview I: Fall freshman year, focused on the transition from home and high school to college.

   2. Interview II: Spring freshman year, focused on parents and upbringing at home.

   3. Interview III: Fall sophomore year, focused on how the student used the summer.

   4. Interview IV: Spring, sophomore year, focused on the student's moral, religious, and political views.

   5. Interview V: Fall, junior year, focused on academic experiences, i.e. teachers and courses.

   6. Interview VI: Spring junior year, focused on peer relations and sexual development.

   7. Interview VII: Fall, senior year, focused on self-concept and perception of change in one's self.

8. Interview VIII: focused on a final assessment of the college years and the experience of being interviewed.

C. Data Analysis Strategies and Statistical Procedures:

1. Most of the numerical data reported were descriptive, i.e. means and standard deviations, sometimes including tests of significance, e.g. t-tests and chi-square tests.

2. Cluster analysis was performed on the OPI data to isolate

(a) "those items that seem to be especially responsive to change brought about by the process of socialization" from

(b) "those items that are more reflective of the personality structure of the individual"

3. Multivariate discriminant analysis was used to develop a typology or student classification system descriptive of students' curricular orientations, based upon the OPI data.

MAJOR FINDINGS:

I. Educational Development:

A. Students come to college to define their identities, to learn skills, and because "its the thing to do".

B. A student typology for each of the eight analysed groups (Stanford and Berkeley men, women, freshmen, seniors) reveal students to be within three classes of interests according to their responses to curriculum:

1. Group A = grades
2. Group B = career preparation
3. Group C = intellectual interests

These classes were found to be statistically different. Furthermore, these differences appear when the students arrive on campus as freshmen.

For all four freshmen groups, Social Maturity scores were highest for students choosing intellectual interests.

C. Choice of college and major seem to be determined without conscious choice.

D. If student and course objectives are not appropriately matched, students may be frustrated or turned off, eliminating growth and learning rote memory work only.

E. About 65% of the June 1965 graduates from Stanford who responded to the follow-up questionnaire were enrolled in graduate school nine months later.

F. Personality characteristics are related to grade point average among men at Stanford, but not at Berkeley and not for women at either campus.

The "grade-oriented" group of men have the highest grade point averages at both schools, but the range across the three groups is insignificant.

Berkeley men claiming an intellectual orientation toward the curriculum had the lowest grade point average of all groups.

II. Personal Development:

A. Identity crises:

1. Identity crises were not as dramatic as expected and were usually not resolved by graduation.

2. Struggles of extraction from "child self" and/or parents' aspirations caused depression and sadness which is seen by the researchers as a positive sign of growth.

3. From interview data, the differentiation of self from parents seems to manifest itself in the realization that the student does not really want to do what he always thought he would do.

4. One form of identity shock may be called "background shock", and it is the realization for the first time that the student has serious background deficiencies compared to other students.

A major adjustment for many students, particularly those from rural areas, is not being "first" any more in the academic, athletic and social competition.

5. In-depth interviews suggest that the most important change in college is the differentiation of self from parents, especially fathers.

In the final senior interview many students reported that parents and self were the most difficult topics to discuss openly.

Students tend to dichotomize their past as reminiscences and the present in terms of reasoning (independent of their past experiences) and fail to recognize the importance of their histories in determining their present attitudes and behaviors.

B. Home environment:

1. The majority of students said that decision-making in their homes was a joint process; one-third of the men and one-fifth of the women felt that their father was dominant.

2. About 55% of the men and 45% of the women said they resembled their fathers in emotional makeup; 41% of the men and 49% of the women said they resembled their mothers.

3. Of all students studied, 3% or less report their mother as deceased; 8% or less report their father deceased (13% for Berkeley women); 8% or less reported parents divorced; 6% of the fathers and 3% of the mothers were reported as having a drinking problem.

4. Most students have difficulty in coping with anger and hostility. Most report an inadequate model as their parents were generally not open about negative expression.

   Two-thirds of the students said they were punished occasionally before the age of 13; nearly two-thirds were punished by both parents; more men were punished by fathers only; more women were punished by mothers only.

   In an open-ended question on the Senior Questionnaire, most students reported that the most effective form of punishment was verbal: scolding, reasoning, lecturing, etc.

C. Attitudes:

1. Half of the men expect to marry after age 24; only one-quarter of the women expect the same for themselves.

2. Men and women agree closely on the desireable number of children, with about 40% wanting three children.

3. Few students propose a life-style widely different from their parents in spite of the rebelliousness associated with autonomy.

4. About half of the men and women agree that the husband should control the wife; the other half are neutral or undecided.

   Forty-four percent of senior women say they like men of whom they are somewhat afraid.

   Eighty-two percent of the women reported they would prefer their husbands to have the decision-making priority; sixty percent of the men reported they would prefer to have priority.

D. Attitudes toward sex:

1. Summaries of the Senior Questionnaire data reveal that about one-third of the students report having achieved a high degree of physical intimacy during college. Women report more conflict regarding sex, but also a greater degree of acceptance of sex.

   Women reported more meaningful relationships with members of both the same and the opposite sex than did men.

   On the Senior Questionnaire, 42% of all respondents said it was much easier to "feel close" to people as seniors than as freshmen; 20% said it was more difficult.

   Students who report a high degree of physical intimacy typically have a long history of frequent dating starting in high school.

2. Researchers found no evidence to support the popular stereotype of widespread sexual promiscuity on campus; rather, most physical intimacy was expressed through serious relationships.

   Of seniors, 75-95% approve of premarital intercourse, interracial marriages, abortion, and equality of sexual freedom for men and women.

   Among the students there was a widespread lessening of moralistic outlook: two-thirds of the freshmen said large numbers of people are guilty of bad sexual conduct; only one-third agreed to this by their senior year.

3. On the Senior Questionnaire, 43% of the men and 71% of the women ranked love and affection among their three most important needs; only about 10% ranked sexual needs in the top three.

   From a list of eleven possible needs, both the freshmen and seniors ranked the following four as most important: 1) love and affection; 2) emotional well-being; 3) maintaining self-respect; and 4) being accepted and liked by others.

   Rankings of personal interests and activities changed strikingly little from freshmen to senior years: career, family, love and affection and developing a personal identity were consistently most important.

E. Personal relationships:

1. Closeness of family relationships is not a determinant of shared values and attitudes.

2. There was a greater permanence of pre-college friendships than expected: about half of the seniors had from one to three close pre-college friends of both sexes.

3. Nearly all students who belonged to fraternities, sororities or eating clubs listed these as important to their development; dormitories were not listed. Other influential groups were "action" groups (especially at Berkeley), professional clubs, religious groups, hobby clubs, student government, and (for Stanford) overseas campus experiences.

F. Personality changes:

1. Only one-third of the men and about half of the women reported much change in personal characteristics after entering college; even fewer reported change in moral, religious, or political views.

2. Summaries of the Senior Questionnaire data suggest that personal growth was more valued by students than intellectual growth.

3. Summaries of Senior Questionnaire data indicate that more than one-third of the respondents felt more stable than they were as freshmen; specifically, they showed more self-understanding, self-satisfaction, self-criticism, more emotional control and

ability to face limitations, and a better defined philosophy and set of interests.

4. Several of the Omnibus Personality Inventory scales (Social Maturity, Developmental Status. Authoritarianism, and Ethnocentrism) have enough in common to allow discussion of changes in aggregate mean differences between freshman and senior scores: there was a trend toward greater open-mindedness and tolerance for complexity and ambiguity, and rejection of a restricted view of life.

   OPI changes between freshmen and senior years show greatest change on the Ethnocentrism Scale and least on the Estheticism Scale for Stanford students.

III. Cognitive-Intellectual Development:

A. Facts had greatest appeal for grade- and career-oriented students; ideas had greatest appeal for intellectual interest students.

B. The group of students showing the greatest pleasure and satisfaction in the use of intellect (as reported on the OPI) also appear free or even alienated from parents.

C. The group of students who are must concerned about preparation for a career are the most practical both as freshmen and as seniors, according to OPI data.

D. The third group, which was most concerned about grades, showed the least tolerance for ambiguity over the four years. Additionally, they were seen as the most rigid, cynical, pessimistic, immature, and tied to their parents.

IV. Vocational Development:

A. Although students say their parents leave occupational choice to students, they are nevertheless strongly influenced by parents aspirations, as well as by the current fashion and opportunities.

   Occupational decisions seem to be "determined" without conscious choice.

B. About three-fourths of the men and women expect the wife to work full-time before children are born; three-fourths also do not expect the wife to work while children are under six. About half expect the wife to work while children are 6 - 12, but only 17% of men and 9% of women do not expect the wife to work after children are past 12. About half (45%) expect full-time and 42% expect part-time work for the wife after children are grown.

C. Vocational orientation may be the strongest influence working against the liberalizing effects of the curriculum; prevents exploration; prevents testing educational and occupational preferences and goals.

Students see many different academic paths to the same career.

CONCLUSIONS AND IMPLICATIONS:

1. Higher education seldom gives students sufficient opportunity for the development of non-intellective skills and guidance in the application of reasoning skills to real world decision-making experiences.

   Highly select colleges force a student to develop narrowly in order to stay on top, which would not be the case at a "state university", i.e., he could compete favorably in his field and still explore other curricular offerings and other environments. Serious and meaningful education can only take place when the curriculum is serving a developmental purpose to which academic education is only secondary. The developmental timetables do not however coincide with present educational timetables; there must be systematic studies to pursue this relationship and recommend alternative educational structures.

   There might also be less expensive means than college to experiment with self, identity, and parental differentiations, e.g. Peace Corps, travel, work, etc. Students should be free to "opt out" of college.

2. It should not seem surprising that socialization changes in college are more pervasive than intellectual development. Socialization aids are everywhere, especially among peer group pressures, whereas intellectual development may involve some fundamental character changes, reorganizing of important ideas, world views, attitudes and feelings. This is an anxiety ridden process for which the student receives very little support. Faculties typically stress mastery of content as the end in itself rather than significant integration with student's own frame of reference.

   Rather than emphasizing the relationship between reason and passion, many instructors caution students against too much involvement and glorify the "cold reasoning" powers versus caring, which is unscientific, subjective and damaging to good research or careful thinking.

It seems evident that the educational environment of an institution can interact with student personality characteristics to affect student behavior in a significant way. Cultural sex-linked differences also interact with institutional differences with regard to the use of intellect. Women's classroom behavior is less affected by personality traits than is men's. Women may accept more easily what is "appropriate behavior" for school and may compartmentalize these attitudes and behaviors from their general characteristics.

3. In general, career groups seem comfortable with others and with themselves. They are more attuned to an external set of rewards than to an intrinsic set of human values. They reject any attempt to evaluate their value system; the result is a loss of creativity and potential for instituting fundamental change.

   Men in intellectual interest groups are flexible and open to questioning fundamentals. They choose personally meaningful careers. Typically, they need rewards beyond the conventional system, and are given to "righting the wrongs of the world".

   The grade group stresses content mastery and resists integration. They show the greatest concern (and dissatisfaction) for interpersonal relationships. They tend to see the college experience as a "battle to survive".

RECOMMENDATIONS:

1. Educators should keep in mind that most freshmen enter college with childhood (superego) exciting powerful constraints on their freedom to develop cognitive, personal motivational growth patterns. Further research is needed concerning the developmental cycles and the adaptability of curricular cycles (requirements).

2. Further research is also needed concerning the differences between men and women with respect to their intellectual orientation and the possible differential effects of the college environment upon their development.

AUTHORS: Irvin J. Lehmann and Paul L. Dressel

TITLE: Critical Thinking, Attitudes and Values in Higher Education

PUBLISHER: Michigan State University, East Lansing, Michigan, 1962

MAJOR ISSUES:

With the growth and expansion of institutions of higher education, it is important to know what kinds of changes occur as a result of college attendance. While educators assume that substantial and desirable learning and development takes place in students who spend four years in college, the existing evidence regarding such change is inconclusive.

Several problems make such assessment difficult. A major one concerns the specification of student changes which can appropriately be expected, given the heterogeneity of students' social-psychological characteristics and aims, of faculty characteristics and aims, and of institutional policies. Even when general goals can be agreed upon, there remains the difficulty of interpreting these goals in terms of measureable behaviors, measuring the degree of changes that occur, and determining the factors that serve to explain them.

Since an assumption underlying higher education is that it will contribute to the growth of skills of critical thinking and foster the growth of attitudes which reflect flexibility and openness to new ideas and understanding and appreciation of points of view other than one's own, an attempt to measure these values and attitudes will contribute to an assessment of the impact of higher education on students.

OBJECTIVES OF THE STUDY:

General Objective:

To assess change in large numbers of students at numerous intervals throughout their four years of college and to investigate factors which might be associated with that change.

Specific Objectives:

1. To obtain a base point for determining change by assessing the attitudes, values and critical thinking ability of Michigan State University freshmen and to determine differences on these dimensions among selected subgroups.

2. To study the interrelationship among the various instruments designed to measure attitudes and values.

3. To study differences among groups of students who complete their freshman year and those who withdraw during their freshman year.
4. To measure students' change during four years of college, to assess change occurring during each year of college and to identify and investigate the factors associated with these yearly changes.
5. To determine if there is a relationship between critical thinking ability, attitudes and values and scholastic performance in the required general education courses.
6. To determine if there are cognitive and/or affective differences between students who do and do not change majors during college.
7. To determine if there are differences in the critical thinking ability, attitudes, and values among students at three midwestern colleges (Michigan State University, a Presbyterian liberal arts college, and a Congregational liberal arts college).

MAJOR HYPOTHESES:

I. Intellectual and Cognitive Development

A. There will be a significant difference in critical thinking ability, attitudes of stereotypy and dogmatism and traditional value orientation between:

1. Males and females; and among
2. Students of differing religious backgrounds
3. Students majoring in different curricula
4. Students of differing home location
5. Students of parents of differing educational levels
6. Students of parents of different socioeconomic backgrounds (reflected by father's occupational level)
7. Students of parents of differing parental place of birth (native born Americans versus foreign born)
8. Students differing in educational goals (those who plan to receive a baccalaureate and those who plan to attend graduate school)
9. Students of differing high school backgrounds

B. There will be a significant interrelationship between critical thinking ability, attitudes, and values. There will be a significant relationship between various instruments to measure these attitudes and values.

C. There will be a significant difference in critical thinking ability, attitudes and values between students who withdraw from college during freshman year and those who complete their freshman year.

D. There will be a significant difference in critical thinking ability, attitudes and values from freshman year to senior year, from freshman year to sophmore year, sophmore year to junior year, and junior year to senior year.

E. There will be a significant relationship between selected biographical demographic variables and the change in attitudes and values after one, two, and three years of college.

F. There will be a significant relationship between certain types of academic and non-academic experiences and changes in attitudes and values.

G. There will be a significant difference in the amount of change in critical thinking ability, attitudes and values occurring during one or more of the four year periods from freshman to senior year.

H. There will be a significant relationship between academic performance (instructor grade, examination grade, final course grade) in four required courses: Natural Science, Communication Skills, Social Science, and Humanities, and critical thinking ability, attitudes, and values.

I. There will be a significant difference between students who remain in their original major and those who change their major.

J. There will be a significant difference in critical thinking ability, attitudes and values among males and females attending two small midwestern colleges and those attending a large university.

INSTRUMENTS AND MEASUREMENTS:

1. A Test of Critical Thinking, Form G, (CT), developed by the Cooperative Study of Evaluation in General Education of the American Council on Education, designed to measure a student's critical thinking ability.

This test measures five abilities thought to be involved in critical thinking:

1. Defining a problem
2. Recognizing stated and unstated assumptions
3. Selecting pertinent information
4. Formulating and selecting relevant hypotheses
5. Drawing valid conclusions

2. The Inventory of Beliefs, Form I (IB), developed by the Cooperative Study of Evaluation in General Education of the American Council on Education, designed to measure sterotypic beliefs (e.g. the tendency toward ethnocentrism; ideocentrism; sociocentrism, and egocentrism).

3. The Dogmatism Scale, Form E, (D scale) developed by Rokeach, designed to measure general authoritarianism (e.g. degree of dogmatism and receptivity to new ideas).

4. The Differential Values Inventory (DVI), developed by Richard Prince, designed to measure the location of a student's values on a traditional-emergent continuum.

   (Tratitional values are Puritan morality; future-time orientation; individualism; and work-success ethic. Emergent values are sociability; relativism; present-time orientation; and conformity.)

5. The College Qualification Test (CQT), developed by Bennet _et al_, designed to measure verbal ability, numerical ability, and general information.

6. The Michigan State University Reading Test, developed at Michigan State University, designed to measure reading comprehension.

7. The College Objectives Test, developed by Kidd _et al_, designed to measure the value the subject attaches to the vocationally oriented objectives and the general educational objectives of higher education.

8. Experience Inventory I, developed by the staff, designed to measure immersion in the campus environment on the following dimensions:

   a. General immersion
   b. Social experience
   c. Academic experience
   d. Interpersonal experience

9. Experience Inventory II, developed by the research staff, designed to measure seniors':
   a. Reactions to the objectives of the college
   b. Appraisal of the effectiveness of the college experience
   c. Views on current issues
   d. Self-perceived changes in interpersonal view, attitudes and values

10. Allport-Vernon-Lindzey Study of Values, developed by Allport, Vernon, and Lindzey, designed to measure values based upon Spranger's theory of types of man which specifies six types: theoretical, economic, aesthetic, social, political and religious.

11. Wesley's Rigidity Scale (authorship is not given) designed to measure personality rigidity and also to study the relationship between rigidity, stereotypy, and dogmatism.

12. Questionnaire, designed by staff (not shown) for obtaining general background information.

LIMITATIONS OF THE INSTRUMENTS AND MEASUREMENTS:

1. Three of the major tests, the Inventory of Beliefs, the Test of Critical Thinking, and the Differential Values Inventory, were given five times during the four year period. Though random sampling was used in the interval years, every student enrolled took the tests at least three times and some took it four or even five times in a four year period. Repeated test effects might be assumed to be operating; however, the investigators do not deal with the ways in which this repeated effect might limit their findings.

2. Test scores are the operational definitions of the variables. Thus the meaningfulness of the findings is directly tied to what the tests are measuring. It is important to keep in mind the limits of each test as the findings are analyzed. For example, the Test of Critical Thinking is a test of five specific abilities incorporated in the processes of critical thinking; it is not a test of critical thinking, per se. The discussion of the use of this instrument is brief (half a page) and does not give any rationale for the use of this

instrument. The instrument is described briefly in terms of its format and reliability. Since the findings and conclusions depend so heavily on test scores from this instrument, the investigators' failure to make the basis of their choice clear is a serious omission. This same comment applies equally to all the instruments used.

VARIABLES STUDIED:

1. General background
    a. Age
    b. Sex
    c. Parents' country of birth
    d. Level of father's education
    e. Level of mother's education
    f. Type of high school attended
    g. Educational aspirations
    h. Religious preference
    i. Father's occupation
    j. Academic major
2. Academic aptitude and ability
3. Reading comprehension
4. Critical thinking ability
5. Stereotypic attitudes
6. Dogmatism
7. Personality rigidity
8. Traditional/emergent value orientation
9. Basic values: theoretical, economic, aesthetic, social, religious, and political
10. Academic performance
    a. Grades in course examination

   b. Instructor given grade
   c. Final course grade
   d. Grade point average

11. College objectives
12. Appraisal of college experiences
13. Change in academic major

DESCRIPTION OF SAMPLE:

1. Size of sample:

| | Males | Females | Total |
|---|---|---|---|
| a. Freshman I (Fall '58) | 1,436 | 1,310 | 2,746 |
| b. Freshman II (Spring '59) | 1,125 | 1,094 | 2,219 |
| c. Sophmore (Spring '60) | 197 | 217 | 414 |
| d. Junior (Spring '61) | 235 | 189 | 424 |
| e. Senior I (Spring '62) | 179 | 144 | 323 |
| f. Senior II (Spring '62) | 590 | 461 | 1,051 |

2. Population:

All native born students who entered college for the first time in Fall 1958 and who were still enrolled at the time of testing. The size ranged from 2,973 in Fall 1958 to approximately 1,100 in Spring 1962.

3. Sex:

Unequal representation of males and females; populations were treated separately.

4. Religious composition of original freshman sample:

| | |
|---|---|
| a. Protestent | 70% |
| b. Catholic | 18% |
| c. Jewish | 7% |
| d. Other | 5% |

5. Racial composition is not reported

6. Sampling procedure:

   a. The first and final testing sample included the entire population of students who turned in complete and usable sets of data.

   b. Interval testing periods used random samples of students who turned in complete and usable sets of data.

LIMITATIONS OF SAMPLING PROCEDURES AND REPORTING:

1. The investigators do not indicate the size of the population from which the interval random samples were drawn.

2. The investigators do not indicate the intended size of the random sample so there is no way to estimate the extent of possible drop-out which might have occurred. If it did occur, there could be a serious bias in the interval findings.

3. When a random sample has been selected and all persons do not turn in usable data, the characteristics of the persons whose data are not usable are lost. There may be a systematic bias operating to affect the direction of the outcome. The investigators do not examine this issue.

STATISTICAL PROCEDURES:

1. Tabulations and cross-tabulations

2. Tests to determine significance of differences between correlated means

3. Pearson product-moment correlations

4. Analysis of variance

5. Analysis of covariance

6. Multiple discriminant analysis

7. Chi-square tests

NON-STATISTICAL PROCEDURES

1 Content analysis

2. Subjective, judgmental assessment

LIMITATIONS OF STATISTICAL PROCEDURES:

1. Major portions of the data are analysed and presented in terms of changes in group means. While this does show the net change in a particular direction, it does not indicate the amount and

nature of individual change. The reports do not indicate how many students experienced change nor the degree to which any single individual student changed.

MAJOR FINDINGS:

I. Intellectual and Cognitive Development

A. At the time of entrance into college, there were differences in critical thinking ability, values and attitudes among the following:

1. Males and females:

Males were significantly more stereotypic and dogmatic than females, and were oriented toward emergent values while females were oriented toward traditional values, had more academic aptitude, and were better readers. In addition, males scored higher on the theoretical, political and economic scales of the Study of Values Test while females scored significantly higher in the aesthetic, social and religious areas.

2. Students of differing religious background:

Catholics were more stereotypic than Protestants or Jews and were also more traditional value-oriented. Jewish students were more emergent in their values.

3. Students majoring in different curricula:

a. Females in non-technical curricula such as social sciences, humanities and communication arts were less stereotypic and less dogmatic than females in vocationally oriented curricula.

b. There were more marked differences between males in different curricula than between females. The trend was that those scoring high in the cognitive area tended to exhibit less stereotypic beliefs, less dogmatism and be less oriented toward traditional values. The exception to this was the female in medical technology who was both high in aptitude and high in stereotypy.

4. Students from differing home locations:

a. For males, there was a significant difference on all variables except critical thinking. Those who lived most of their life on a farm were more stereotypic, dogmatic and traditional value-oriented.

    b. For females, there were no significant differences except that those who lived most of their life on a farm were more traditional value-oriented.

5. Students whose parents are of different levels of educational attainment:

    a. For females there was no marked difference in critical thinking ability; for males there was a difference in critical thinking ability. Higher critical thinking scores were associated with more father education.

    b. Students whose parents had a high level of education were less stereotypic and dogmatic, had lower traditional value scores and had higher general academic aptitude scores.

6. Students of parents of different socioeconomic levels (reflected by father's occupation level):

    Males and females with fathers high on the continuum of occupation levels were more emergent in values, less stereotypic and less dogmatic.

7. Students of different parental backgrounds:

    There was no significant difference in critical thinking, values and attitudes between students whose parents were born in this country and those whose parents were foreign born.

8. Students differing in educational goals:

    Males and females who desired more education tend to have higher scores on cognitive measures, be less stereotypic, dogmatic and more emergent in their values than students who aspired to four years of college or less.

9. Students of differing high school backgrounds:

    Students from public high schools were least stereotypic and dogmatic while students who attended a parochial high school were most stereotypic and dogmatic and had the highest traditional value scores. These findings were consistent with the findings regarding religious groups.

(Hypothesis A confirmed)

B. There are significant relationships between the various affective and cognitive measures as follows:

   1. The Inventory of Beliefs and the Dogmatism Scale were related positively and significantly (-.63 for males; -.61 for females)*.

   2. The relationships between the Inventory of Beliefs and Wesley's Rigidity Scale and the Dogmatism Scale and the Rigidity Scale were not significant.

   3. The four sub-scales of the Differential Values Inventory (traditional values) were correlated at a significant level ($p. < .05$). The four sub-scales of the Differential Values Inventory (emergent values) were also correlated significantly ($p < .05$).

   4. Differential Value Inventory scores (both sub-scales) were not significantly related to scores on the Inventory of Beliefs or the Dogmatism Scale or aptitude measures. There was no significant relationship between traditional values and measures of stereotypy, critical thinking ability, verbal comprehension and general aptitude for males or females.

   5. The Test of Critical Thinking exhibited significant relationship with the Inventory of Beliefs and the Dogmatism Scale and cognitive measures of reading and general aptitude. Thus factors found in reading and general ability tests were operating in the Inventory of Beliefs and the Dogmatism Scales to a significant degree. They are nearly non-existent in most of the Differential Values Inventory sub-scales.

(Hypothesis B confirmed, with some qualification)

C. There is a significant difference in critical thinking ability and in stereotypy between those who complete the freshman year and those who withdraw during the freshman year. There is no significant difference in dogmatism or traditional value orientation.

   1. Those who completed the freshman year had significantly higher scores in critical thinking ability, reading ability and academic aptitude than those who withdrew ($p. < 05$).

   2. The Inventory of Belief scores of those who completed the freshman year were slightly but significantly higher than those who withdrew ($p < .05$).

   3. There were no significant differences between the two

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* Negative correlations because of reversed scoring procedure.

groups on either the Dogmatism Scale or the Differential values Inventory.

(Hypothesis C confirmed, with limitation)

D. There were significant differences in critical thinking ability, attitudes and values from freshman year to senior year, from freshman year to sophmore year, sophmore year to junior year and junior year to senior year as follows:

1. From freshman year to senior year:

    a. Both males and females received significantly higher scores in critical thinking as seniors than they did as freshmen ($p < .05$).

    b. Both males and females received significantly higher scores on the Inventory of Beliefs as seniors than they did as freshmen ($p < .05$).

    c. Both males and females received lower scores on traditional values as seniors than they did as freshmen and thus moved toward scores indicating emergent values ($p < .05$).

    d. Both males and females received significantly lower scores on the Dogmatism Scale as seniors than they did as freshmen ($p < .05$).

    e. There was some increase in homogeneity on each of these measures by the end of senior year.

2. Self-perceived changes from freshman to senior year, as reported on the inventory indicate that:

    a. A majority have changed opinions, values and attitudes in one direction or another; a small percentage changed in what can be termed a negative direction; a sizeable number of students reported no change.

    b. The data on religious changes are contradictory:

    Some students became more attached to a religion and its beliefs; some became less so. There was not a decrease in numbers of students who reported less feeling of the need for religion.

    c. More seniors than freshmen felt that it was important to acquire a liberal education rather than a vocationally oriented education.

3. Changes during the sophomore year:

   a. Between the end of the freshman year and the end of the sophomore year changes took place as indicated by scores on the Test of Critical Thinking, the Inventory of Beliefs, the Dogmatism Scale and the Differential Values Inventory. There was an improvement in critical thinking processes; there was a lessening of stereotypy and there was a movement toward emergent value orientation ($p < .05$).

   b. Interview material suggests that:

      (1) Religion did not play an important part in the students' life. There was some questioning but little change in beliefs and attitudes.

      (2) Moral values were relativistic and students object to cheating, dishonesty, and immorality if these affected the students' life.

      (3) College sophomores appeared unconcerned about things and events going on outside of their immediate envrionment.

      (4) Students viewed material things as more important in life than services performed for the betterment of society.

4. Changes during the junior year:

   a. Between the end of the sophomore year and the end of the junior year there were no marked changes in critical thinking ability and traditional value orientation; female value orientation became more homogeneous; there was a lessening of stereotypy among both males and females but it was of lesser magnitude than in the two previous years.

   b. Interview material suggests that:

      (1) Emergent values of hedonism, relativism and conformity were more important than traditional values.

      (2) Students were more tolerant of racial and religious differences.

      (3) Students were more respectful of others' views.

      (4) Students were apathetic concerning world affairs.

5. Students valued families' advice to a greater extent than they did as freshmen.

6. Students resented rules which they felt interfered with their independence.

7. Students were more concerned with obtaining a college degree than they were in attaining a "liberal" education

8. Students did not feel that they have been fully prepared to meet the demands of the outside world.

9. In all the above changes, there were differences between males and females and in the degree of change.

5. Changes during the senior year:

   a. As seniors, both males and females scored significantly higher in critical thinking ($p < .05$). However, the increases were smaller than in any of the previous years.

   b. Females did not change scores in stereotypy; though significant ($p < .05$), the investigators state that the males' change in stereotypy is of no practical consequence.

   c. There was some movement toward emergent values but for practical purposes the investigators state that the value system was stable.

   d. There was no clear-cut pattern with respect to religious concepts for either men or women. Students' concepts of Prayer, God, Sin, and Eternity were quite absolute in both freshman and senior years. Their conception of the Bible as seniors was more relative.

6. Views of seniors:

   a. Seniors attached more importance to grades and to a well-rounded education which includes general education courses.

   b. Most seniors felt college professors should be allowed to subscribe to any political or ideological belief they wish. However, they should not interfere with students' behavior.

   c. Most seniors agreed about the characteristics of a good college teacher: one who makes his students produce, knows his subject matter, can teach in an entertaining fashion and who grades objectively.

d. Seniors generally acknowledged the importance of the general educational goals of college.

(Hypothesis D confirmed)

E. There was only a slight relationship between selected biographical and demographic variables and changes in attitudes and values after one, two, and three years of college.

1. When a group of freshman "changers" was analyzed, it was found that change in value orientation (in either direction) was associated with religious affiliation and level of father's education ($p < .05$); while mother's education, father's occupation, locale of home, and type of secondary school attended bore no significant relationship to change in value orientation or attitude change.

2. When a group of sophmore "changers" was analyzed, it was found that home background played a minimal role in determining the degree and extent of changes in attitudes and values. No single background factor was significantly associated with change in attitudes or values.

(Hypothesis E not confirmed)

F. There were some significant relationships between certain types of academic and non-academic experiences and changes in attitudes and values.

1. When freshmen "changers" responses were analyzed, it was determinined that females reported a significant relationship between changes and (1) a course or courses and (2) cultural activities. Those who were traditional value-oriented indicated their courses had an impact on their behavior.

   For males there was a relationship between rules and regulations and changes in stereotypic beliefs. Those who became less stereotypic reported that rules and regulations had an impact on their behavior.

2. In the sophmore year, in general, no single type of experience could be isolated to account for changes. However, females did mention courses significantly ($p < .05$) and males mentioned the need to conform significantly ($p < .05$).

3. Five experiences which sophomores said had positive effects were:

   Close friends, person dated, being away from home, sorority/fraternity, and family.

4. Five experiences which sophmores said had negative effects were:

   Campus regulations, conduct pattern of students, a course in the major subject, a course other than one in the major subject and a general education course.

5. Junior year experiences which were felt to be reinforcing by both males and females were:

   An instructor in the major area, a course in the major area, a close friend, and a fraternity/sorority.

6. Five experiences which male juniors said had modifying effects were:

   A close friend, discussions/bull sessions, ROTC, a date, and campus regulations.

   Five experiences which females said had modifying effects were:

   A date, a close friend, discussions, being away from home, and a course in the major subject.

7. At the end of the senior year, for both males and females, the five reinforcing factors that were ranked at the top in junior year were ranked at the top in the senior year. The factors males and females listed as having a modifying effects in junior year were listed again in the senior year.

(Hypotheses F and G confirmed)

H. There were some significant relationships between academic performance (instructor grade, exam grade, final course grade) in four required courses (Natural Science, Communication Skills, Social Science, and Humanities), and critical thinking ability, attitudes and values.

1. For both males and females, there was a higher correlation between stereotypic beliefs and final examination grade than between stereotypic beliefs and instructor grade. This was true for each of the three terms work in Communication Skills, Natural Science, Social Science and Humanities. However,

none of the correlations were large; the highest was .33; the majority were below .20.

2. There was a similar tendency in the relationship between dogmatism scores and measures of scholastic performance. However, the Dogmatism Scale was a better predictor of examination grades than of instructor grades. Differences were less than .10, on the average.

3. For the most part, there was no significant relationship between scholastic performance and traditional-value orientation for either males or females.

4. The batteries of cognitive tests had many significant correlations with academic performance measures. Nearly all correlations between these tests and grades ranged between .39 and .62.

5. The inclusion of a battery of affective variables contributes very little to the overall prediction of academic success. This is so whether the measure of academic success is in terms of grade-point-average or in specific general education courses.

6. The College Qualifying Test is the best single predictor of academic success as measured by grade-point average.

(Hypothesis H confirmed)

I. There were some significant differences between students who remained in their major and those who changed their major.

   1. For males there was a significant difference among the three groups ($p < .05$), (those who changed majors and had a grade point average above 2.0; those who changed majors and had a grade point average below 2.0 and those who did not change majors) in stereotypy, dogmatism, and traditional value orientation.

      Those students who changed majors and had a low grade point average were the most stereotypic and dogmatic. However, in terms of value orientation the non-changers had the highest mean traditional value score; the changers with a grade point average of 2.0 or above had the lowest, while the changers with a grade point average below 2.0 were in between.

   2. For females there were no significant differences in stereotypy or dogmatism scores between any of the three groups.

3. For females, the changers with grade point averages below 2.0 had significantly higher traditional value scores than changers with grade point averages above 2.0 and those who did not change their majors (p .05).

(Hypothesis I confirmed)

J. There were only slight differences in critical thinking ability, attitudes and values among males and females attending two small midwestern colleges and those attending a large university.

1. Students at the large university had significantly higher critical thinking test scores than students at small church-related colleges ($p<.05$).

2. When critical thinking score was controlled, the only significant difference on affective measures was on the stereotypy score for males.

3. Scores on the test of religious beliefs showed that there was no significant differences among males in the three institutions in their perception of God and the Bible. For women there was a significant difference (p .05). The nature of this difference was not reported.

4. There was no significant difference in the homogenity among the students at the three colleges on the four affective and cognitive variables.

(Hypothesis J confirmed with limitation)

CONCLUSIONS:

1. The major differences between the stereotypic and the highly traditional student appear to be more related to socioeconomic and religious factors than to educational aspirations, academic aptitude and level of parental education. Background factors related to socio-cultural level appear to be quite operative as far as attitudes and values are concerned.

2. The data suggest that intellectual ability must be considered as the prime factor related to withdrawal from college. However, it may be that other factors such as motivation, drive and needs may be more related to persistence than are the purely intellectual and social index factors. In addition, it should be noted that factors of general academic aptitude cannot account for existing differences between students.

3. Even though there was significant improvement in critical thinking ability, a lessening of stereotypic beliefs and a

movement away from a traditional value orientation during college, the magnitude of the changes leaves much to be desired in terms of the professed objectives of the university.

4. If a bridge could be built between the classroom and informal student discussions, change might be facilitated. Many students reported that "bull sessions" were important sources of impact and that the ability to get along with different kinds of people was a significant experience in terms of maturing.

5. The findings with respect to differences in the three colleges were surprising since it was expected that there would be very clear differences between attitudes and values among students at small church-affiliated colleges and a large university. Differences were for the most part a function of the difference in general academic aptitude. Wider curricular offerings at the university may be a factor attracting the better critical thinker.

CRITIQUE OF THE STUDY:

1. This study makes a contribution to the literature concerning impacts of college on student thinking, attitudes and values. While the development of cognitive skills is regarded as an aim of education, colleges rarely assess the extent to which this is achieved. Course grades are commonly accepted as an index of student's progress toward intellectual growth. To attempt a broader assessment is a worthwhile goal.

2. The limits of the study are defined mainly by the limits of the testing instruments. In spite of this, the investigators do not discuss the reasons for their choice of instruments. Since the meaning of the findings is so directly tied to what the test is measuring, the failure to discuss the instruments thoroughly is a serious omission. For example, in what ways is it valid to think of critical thinking in terms of the five skills tested by the Test of Critical Thinking? What important cognitive skills are not tested? What skills important in thinking have been identified that might be difficult to test for with existing instruments? Were tests other than this one considered? What might be the test-retest effects?

3. The outcomes reported in this study are not necessarily unique to college. While they may relate only to college experience, they could be part of the normal maturation of young adults.

4. Attitude changes were generally in the direction of acceptance of cultural attitudes which prevail in college. They may reflect change toward conformity (conformity is one of the emergent values) as much as change because of critical evaluation. The nature of the change remains unclear.

5. The investigators interpret no change, unexpected or negative change in various ways. For example, in speaking of types of changes, the investigators note " It was assumed that any subject who appeared to become a poorer critical thinker actually did not but that this phenomena was due to errors in measurement" (p. 67). No basis for this comment is given. Nor is it clear why certain findings could be allowed this interpretation.

6. An explicit discussion of the assumptions that the investigators made about the measurement of change (e.g. change in test scores indicates actual change) and a discussion of the meaning of change at the .05 level of confidence, would be useful for assessment of the real significance of the findings.

AUTHORS: Irvin J. Lehmann and Paul L. Dressel

TITLE: Changes in Critical Thinking Ability, Attitudes, and Values Associated with College Attendance

PUBLISHER: Michigan State University, East Lansing, Michigan, 1963.

MAJOR ISSUES:

The major issues of this study are the same as those of its predecessor, Critical Thinking, Attitudes and Values in Higher Education (1962), which was concerned with assessing the impact of college attendance on critical thinking skills and on changes in personality.*

OBJECTIVES OF THE STUDY:

General Objective:

To investigate the degree and direction of changes in critical thinking, values and attitudes of students who attended Michigan State University for four years without interruption and to compare these changes with those of students who withdrew from college at the freshman, sophomore, and junior levels and who did not transfer to other schools.

Specific objectives:

1. To investigate the relationship between the amount of college attendance and the degree and direction of change in stereotypic beliefs, dogmatism and traditional values.
2. To study the differences among students completing various amounts of college with respect to their opinions of classes, instructors, grades, grade satisfaction, difficulty of college, future plans, and value of general education courses.

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* In spite of a great deal of research on the impact of college on such variables, however, investigators have rarely compared a control group with their longitudinal collegiate sample, a design used by Lehmann and Dressel in this study and described as "before-and-after comparison of exposed and unexposed groups." (p.22) Such an omission ignores the possibility that changes in personality may be due to natural maturational processes or to societal situations and events.

3. To compare groups of students completing various amounts of college with respect to their opinions about major political, social, and economic issues.

4. To study differences among these groups regarding planned future participation in community activities.

5. To investigate the differences among these groups regarding their ratings of the importance of various objectives to be attained in college.

6. To compare responses among the four groups between 1958 and 1962 with respect to self-perceived changes occurring in these four years.

7. To study the impact of varying amounts of college attendance on religious attitudes.

8. To study the differences in opinions among the groups regarding the type of community in which they prefer to live.

9. To describe college experiences, as identified by the respondents, which either strengthened or modified the subjects' beliefs and attitudes and to compare the responses of each of the groups.

10. To determine whether or not academic aptitude affects changes in attitudes and beliefs among the four groups.

11. To study the impact of sex on changes in attitudes and beliefs among students completing varying amounts of college.

12. To examine changes in critical thinking ability occurring between the freshman and senior year of college.

## MAJOR HYPOTHESES:

### I. Cognitive - Intellectual Development

A. There will be no significant differences in the direction or degree of change in values and attitudes among those students who have completed one, two, three, or four years of college.

B. Academic aptitude does not affect the degree or direction of change in attitudes and beliefs among subjects completing varying amounts of college.

C. Sex does not affect the degree of change in attitudes and beliefs among students attending college for one, two, three or four years of college.

D. There will be no significant differences in critical thinking abilities between the freshman and senior years.

METHODOLOGY OF STUDY:

1. Purpose: Descriptive, explicative

2. Type of Data Collected: Survey

3. Type of Design: Four-year longitudinal

4. Population:

   a. Target population: College students in the United States.

   b. Experimental population: All students who were native born and who were first-time students enrolled at Michigan State University in the fall of 1958 and who completed, or were completing, at least 10 quarters of school at either Michigan State University or other schools in the spring of 1962.

   c. Control group: All students who were also native-born, first-time enrolled students at Michigan State University in the fall of 1958 but who had withdrawn before they had finished 10 quarters and who were not in college in the spring of 1962. The control group was divided into three subgroups:

      1C: those who, by spring, 1962 had completed less than one year of college

      2C: those students who had completed between one year and two years;

      3C: students from the original sample who had finished between two and three years of college.

5. Sampling Procedures:

Institutions: No sampling. Apparently Michigan State University was chosen because of its convenience to the researchers.

6. Description of sample:

The original sample consisted of 2,746 students tested as first-time, native-born freshman starting Michigan State University in the fall of 1958.

The samples consisted of:*

| | Males | Females |
|---|---|---|
| a. Experimental (Group IV): | 658 | 530 |
| b. Control: | | |
| 1C (Group I) | 110 | 147 |
| 2C (Group II) | 61 | 104 |
| 3C (Group III) | 90 | 101 |
| Total control N: | 261 | 352 |

7. Sample Representativeness:

The authors state, "It can safely be assumed that students attending a large public institution, such as Michigan State University, represent almost all the shades of social classes." (p. 24) This is the only information reported in this volume concerning the representativeness of the sample.

8. Non-respondent follow-up procedures:

a. Experimental group: These students were contacted during spring, 1962, to set up a testing appointment with the researchers. No description of non-respondent follow-up was given. Useable data were submitted by 68% of this group. No explanation was given of how the 54 students at other schools were reached.

b. Control groups: Several weeks after the first wave of materials were sent, reminder letters were mailed to non-respondents. Again, several weeks after this, a post card was sent to remind students to return the test materials. Finally, after two more weeks, non-respondents near large centers in Michigan were called. Students not near these centers received another post card. The total number of useable responses received was 60% of the total withdrawal population.

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* These figures vary according to the table used. The authors state, however, that 8 males and 46 females who were originally considered to be part of the control group (that is, they had withdrawn from Michigan State University before their fourth year) were found to have graduated from other colleges and thus were included in the experimental group. The figures above reflect this modification.

INSTRUMENTS AND MEASUREMENTS:

1. A Test of Critical Thinking, Form G, (CT), developed by the Cooperative Study of Evaluation in General Education of the American Council on Education, designed to measure a student's critical thinking ability.

   This test measures five abilities thought to be involved in critical thinking:

   a. Defining a problem

   b. Recognizing stated and unstated assumptions

   c. Selecting pertinent information

   d. Formulating and selecting relevant hypotheses

   e. Drawing valid conclusions

2. The Inventory of Beliefs, Form I (IB), developed by the Cooperative Study of Evaluation in General Education of the American Council on Education, designed to measure stereotypic beliefs (e.g. the tendency toward ethnocentrism; ideocentrism; sociocentrism, and egocentrism).

3. The Dogmatism Scale, Form E, (D scale) developed by Rokeach, designed to measure general authoritarianism (e.g. degree of dogmatism and receptivity to new ideas).

4. The Differential Values Inventory (DVI), developed by Richard Prince, designed to measure the location of a student's values on a traditional-emergent continuum.

   (Traditional values are Puritan morality; future-time orientation; individualism; and work-success ethic: Emergent values are sociability; relativism; present-time orientation; and conformity.)

5. The College Qualification Test (CQT), developed by Bennet et al, designed to measure verbal ability, numerical ability, and general information.

6. The College Objectives Test, developed by Kidd et al, designed to measure the value the subject attaches to the vocationally oriented objectives and the general educational objectives of higher education.

7. Experience Inventory II, developed by the research staff, designed to measure seniors':

   a. Objectives of the college (10 related to vocational training; 16 related to general education goals)

   b. Appraisal of the effectiveness of the college experience.

   c. Views on current issues.

   d. Self-perceived changes in interpersonal view, attitudes and values.

STATISTICAL PROCEDURES:

1. Analysis of covariance

2. Scheffe method of post-hoc comparison

3. Chi-square tests

4. Regression equations

5. Means and standard deviations

6. T-tests to determine significance of differences between correlated sample means

7. Reliability coefficients

8. Ranking of frequencies

MAJOR FINDINGS:

I. Cognitive and Intellectual Development

   A. Changes* in stereotypy, dogmatism and traditional values:

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* All changes reported were significant at the .05 level or beyond.

1. With few exceptions, when 1958 scores were compared to those obtained in 1962, all groups showed an increase in critical thinking ability, a trend towards traditional values and a decrease in stereotypic beliefs, dogmatism, authoritarianism and unreceptivity to new ideas.

2. Group IV (experimental) males moved more toward emergent values than did any of the control group males, who all moved toward an increasing orientation toward traditional values between 1958 and 1962; the less college attended, the greater the movement toward traditional values.

3. For women, however, only freshmen dropouts became more traditional in their value orientation; for the rest of the female subjects, the more school completed, the more oriented they became to emergent values.

4. There were no significant differences among the four groups, either sex, with respect to degree of change in dogmatism. All groups became less dogmatic.

5. Regardless of time spent in college, there was a decrease in stereotypic thinking. Only for the females were there significant differences among the four groups when degree of change was considered: the longer a female stayed in college, the less she adhered to stereotypic beliefs.

B. Changes in critical thinking ability:

1. Seniors obtained higher scores on a test of critical thinking ability than they had as entering freshmen.

2. The major changes, however, appear to occur in the freshman year: there were less, but some, positive changes at the end of the sophomore and senior years, but no gains were noted for juniors.

II. Educational Development:

A. Opinions of classes, instructors, grades, and future plans.

1. All four groups, both sexes, were in agreement about qualities of a good teacher: someone who participates in campus activities, discusses career plans with students, who knows his field, is an entertaining teacher, and who grades objectively.

2. There were significant differences among the four groups with respect to their belief that faculty members should be permitted to hold whatever political or ideological views they wished. The percentage holding this view increased with the amount of college attended. Also, freshman dropouts were more emphatic in their opinion that faculty must not try to inculcate their beliefs in their students.
3. For both sexes, all four groups described their teachers as enthusiastic; over two-thirds of each group did so.
4. No significant differences appeared among females regarding items pertaining to how interesting classes were at Michigan State University. For men, however, the more college attended, the more the opinion was expressed that classes were interesting.
5. Over 60% in each group felt that all students should be required to take general education courses. Although there were no important differences among males in the four groups, the degree of support for general education courses varied among female subjects: Group I and II women were more favorably disposed towards general education requirements than were senior women.
6. The groups varied significantly on opinions that college was harder than originally anticipated. For men, this conviction decreased the longer they were in college. More Group I and III females than men felt that college was less hard than they had expected.
7. Seniors stressed the importance of good grades more than freshman dropouts.
8. A significant percentage of seniors were not satisfied with their grades.
9. There were no significant differences between amount of college attended and certainty of future plans, although proportionately fewer seniors had definite plans than freshman withdrawals. Overall, over 50% of the men and over 40% of the women were uncertain of what they would be doing in the immediate future.

B. Opinions on major political, social, and economic issues:

No definite patterns emerged according to amount of college and opinions. There was general agreement among all four groups, both sexes, that Red China should not be admitted to the U.N.; that the Federal government should provide care for the elderly; that the U.S. should not stop atmospheric nuclear tests; that heavy petting was a permissible sexual outlet for unmarried students; and that someone employed in a skilled trade was as worthwhile to society as a professional worker. But the authors were not able to determine whether seniors were more or less conservative than the controls.

C. Importance of various objectives in college:

1. Regarding ratings of the importance of vocational and general education goals, in 1962 all four groups were similar in believing in the value of "a well-rounded education," although as freshmen they had stressed more vocational preparation as an important objective of a college education.

2. Although a majority of students in each group felt that academic and social development should receive equal stress in college, the females varied significantly in their responses to this item: female freshmen dropouts most often indicated that these two areas should receive equal emphasis and the female seniors most often disagreed. Due to the wording of the item, however, it is not possible to determine which of the two areas the experimental females favor.

3. When asked what factors in colleges resulted in high prestige among both students and faculty, all groups agreed that academic values, including qualities such as originality, creativity, scholarship and dedication to studies, were important.

## III. Personal Development*

A. Planned future participation in community activities:

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* Although the following findings are presented under the heading of Personal Development, many of the findings are clearly relevant to Cognitive-Intellectual Development and general Educational Development.

1, Some significant relationships were found between amount of college attended and planned participation in community activities: students with more college tended to plan more on taking part in country clubs and in cultural functions.

2. There were no differences between amount of college and plans to participate in the PTA and in men's or women's clubs.

B. Characteristics of community in which subjects prefer to live:

1. The groups tended to agree that the following characteristics of a community were desirable: availability of a good education for their children, availability of a good bookstore, a good library, and opportunity for an active social life.

2. The more college a subject had, the greater the existence in his "ideal" community of a good bookstore and a theater showing foreign and art films.

3. The females, more than males, as they completed more school, stressed chances to attend cultural events (music, drama), opportunities to discuss serious issues, and a good public library.

C. Self-perceived changes occurring between 1958 and 1962:

1. All subjects felt that they had become more flexible, less authoritarian, more open-minded and understanding about others, changed their ideas about behavior standards, were more able to define their life goals, become more assured of their ability to handle new problems, started to question moral and religious absolutes and become more interested in world events.

2. There were significant differences among the four groups and between the sexes in degree of self-perceived changes. In all of the following areas, the more college attended the greater the increase in:

a. tolerance of people of different races or beliefs

   b. insight into others,

   c. interest in social, intellectual, and cultural affairs,

   d. critical reasoning (for males only),

   e. responsibility for behavior,

   f. belief in the importance of a liberal arts education,

   g. pessimism regarding the future of civilization.

   Similarly, as subjects completed more college, there was a progressive decrease in:

   a. acceptance and adherence to a religious affiliation,

   b. respect for rules.

3. Overall, more women than men expressed the belief that between 1958 and 1962 they had come to respect views contrary to their own. However, only for men, was the amount of college attended significantly related to an increase in this self-reported change

4. For women only, there was a direct positive relationship between amount of college and increase in:

   a. tolerance of nonconformist dress or behavior,

   b. interest in politics and scientific developments,

   c. conviction that an individual can determine the quality of education received more than the institution,

   d. the perceived importance of money.

   Also, the more college attended, the less a female indicated a respect for persons in authority.

5. A sizable number of respondents did not feel that any major changes had occurred in their attitudes, values or interests.

6. A small percentage felt that they had changed in the direction of becoming less tolerant, less receptive to new ideas, and less respectful towards the views of others.

7. Over three-fourths of the respondents believed that college had had a liberalizing effect on their views; but there was no significant association between amount of college and this belief. However, overall, between 1958 and 1962 there was a lessening of "no response" responses to this item, suggesting that, whatever the direction of change, college may help students in developing opinions.

D. Changes in religious attitudes:

1. The more college attended, the less respondents indicated an involvement in religion. Nonetheless, the proportion of students indicating that religion was valuable in leading a mature life did not change in the four years covered.

2. There was no evidence that college makes one more liberal or more absolute regarding religious beliefs: the four groups were more alike than not regarding concepts of God, sin, prayer, eternity, man and the Bible.

E. College experience influencing beliefs and attitudes:

1. As subjects completed more college, they were more likely to cite academic experiences as having an impact upon them. Such experiences included classes and teachers in the major fields. First and second-year withdrawals, on the other hand, frequently indicated that non-academic aspects of college life, such as friends, "bull sessions", and merely living away from home, had more of an effect upon them than academic experiences.

2. Although most of the students indicated that instructors and courses affected their beliefs more than friends, all groups believed that their peers exerted a great influence.

3. Females indicated that they were influenced by non-academic experiences more than did male subjects, such experiences being friends, dating, and living away from home.

4. Control group males cited general education courses as having a greater impact on their behavior than did seniors, who stressed major field experiences.

F. Effect of academic aptitude on personality changes: For all groups, both sexes, there was no significant relationship between changes in attitudes and values and academic aptitude.

G. Relationship of sex and changes in attitudes and beliefs: Females, particularly seniors, changed to a greater degree in their attitudes, values and opinions between 1958 and 1962 than did their male counterparts. The women became progressively less dogmatic, less stereotypic and less oriented toward traditional values.

CONCLUSIONS AND IMPLICATIONS:

1. The question of relative impact on personality of college attendance as compared to ordinary maturational and extra-institutional factors remains a moot issue, since in many cases there were no significant differences between the control and experimental subjects. Although some of the reported changes cannot be directly traced to college attendance, the authors point out that many changes appearing in the seniors' responses appear to have been a result of freshman experiences. This indicates, therefore, the possibility that similar changes observed in the controls in 1962 were the result of their freshman year at Michigan State University and that the freshman year was an important catalyst for later changes, even if the subjects withdrew from school.

2. The frequent lack of significant differences between changes in the controls and the experimentals suggests the possibility that colleges are not accomplishing as much as they should be.

3. Reinforcing this possibility is the fact that large numbers of subjects did not believe that their values had changed in the four years covered by the study. The authors, however, did not note whether or not these students had changed according to objective measures; the lack of self-perceived changes may be due to students' unwillingness to accept their own former beliefs. For example, a subject who responds that he is the same now as he was as a freshman with respect to tolerance of others, may not want to acknowledge that four years previously he was less tolerant.

4. The finding that the freshman year is an important one in effecting changes, both in critical thinking ability and in values, suggests the need for educators to focus on the first year of college when structuring experiences.

5. For the most part, changes, either in kind or degree, were not related to general academic ability. Such a discovery should serve as a warning to those who feel that college benefits only students with average or above average ability, and who would, therefore, exclude less able students from college on this premise.

6. Those concerned with higher education must accept the fact that formal academic experiences may have less impact on behavioral changes in students than natural growth and the environment.

RECOMMENDATIONS:

1. Because many students in all groups indicated that informal discussions affected their attitudes, colleges should make greater efforts to facilitate informal learning experiences and also should try to integrate formal academic work with these informal experiences.

   As the subjects completed more college, the trend was toward increasing conformity. If higher education is concerned with changing attitudes, it must provide more experiences, such as "bull sessions" which were found to have a great impact on beliefs and attitudes.

2. Similarly, colleges must become more concerned about the social and emotional development of their students.

3. Based on student responses, the authors insist that higher education must not try to change student attitudes forcibly but should instead help students learn skills in problem-solving, teaching them to be objective and rational.

4. Furthermore, before trying to change attitudes, colleges must first assist students in understanding their own values. A corollary of this is that ample opportunity should be provided for students to have contact with those of different attitudes and values.

5. Because there were differences in changes between male and female subjects and also in the experiences which effected these changes, the authors recommend that colleges respect and utilize these differences rather than attempt to fit both sexes into identical experiential molds.

6. Students should be permitted to have more of a voice in decision-making at their schools. Such participation would enhance the quality and value of education for the

student. (The reader is reminded that this and the next recommendation were made ten years ago and that such ideas, commonplace now, were innovative at that time).

7. College attendance does not make students amoral or anti-religious, as some people fear. It is, however, a time when young people question accepted beliefs, and this is a process which higher education must nurture. The authors suggest that more independent study courses, less restrictive living situations and greater opportunity for informal communication would help the process of emotional and intellectual growth.

8. College students should be exposed to more "process values" -- how judgments are made rather than to "ultimate values" -- truth, beauty, etc. This will better prepare them to make mature decisions.

9. Also, colleges must help and motivate their students to develop ways of pursuing learning independently.

LIMITATIONS OF THE STUDY:

In focusing on attitudinal changes of college students and by comparing subjects who were of similar ages but who had completed differing amounts of college, Lehmann and Dressel have grappled with an important issue in higher education: how much are changes in students the result of their college experiences? Nevertheless, certain limitations and criticisms of their study must be mentioned:

1. Regarding the relationship between attitude changes and general academic aptitude, the authors note that, "the problem of regression has not been totally controlled..."; and, thus, correlations are merely "suggestive" and not absolute. (p.141).

2. The finding that there is a relationship between growth in critical thinking ability and amount of college attended should be interpreted cautiously since the experimental group was not compared to the controls used in the rest of the research. Because the Critical Thinking Test is a timed examination, the investigators did not feel that the mailed returns of the controls were accurate assessments of the dropouts' abilities. Therefore, the authors used results of the test when given to random samples of students at the end of their second and third years at Michigan State University.

   The composition of this new group of controls is not clear. The authors write, "...it was decided not to administer this test to the control subjects but only to those who were still enrolled at Michigan State University (experimental group). This test was also administered to different random samples of the population at the end of their sophomore and junior years". (p.148). There are two possible interpretations of this description:

   1) that all three groups, including the experimental, were given the Test of Critical Thinking in 1962, or, less likely,

   2) that between 1958 and 1962 in the course of this study the authors had already tested a random sample of sophomores and juniors when the experimental subjects were also at these levels.

   Either way, it appears that for the testing of Hypothesis IV the controls were younger than the experimental subjects. Comparison of test scores, therefore, has a limited usefulness, since the variable of natural maturation was not controlled.

3. Better organization of the findings and greater clarity in presenting the data would improve the value of this study. On a number of occasions, findings are either contradictory or redundant. For example, the authors conclude that for men there was a significant relationship between amount of college and how interesting students found their classes. The authors conclude, "This progression, however, did not increase in a linear fashion." (p.156) If a relationship does not increase in a linear fashion, is it progressive?

   An instance of redundancy occurs in the summarizing chapter on the same page. Finding #2 states: "...for the male withdrawals, those males who attended college for 0-3 terms became more traditional-value oriented (between 1958 and 1962) than their withdrawal counterparts who attended for 4-6 or 7-10 terms". (p. 155)

   Finding #6 includes this statement: "The only similarities in the direction of value changes for the sexes were for those who withdrew during their freshman year (became more tradition-value oriented) and for those who attended college for four years (became more emergent-value oriented)." (pp. 155-6)

   The reader finds that it is often necessary to double check previous statements to be certain that a finding is clearly understood. More careful summarising of results would enhance the value of the study. Findings were presented from six vantage points: male/female or both and degree/direction of change or both. The results were often confusing to read because one was not certain whether significance was defined in terms of sex,direction, degree of change or some combination of the three.

   In short, due to the multitude of findings, (many important, some seemingly trivial),the authors should have been more careful in summarizing major findings and should have subsumed specific related results under each. Even the summary chapter mixes major generalizations with detailed descriptions of findings in a frequently haphazard manner.

4. Another criticism of the study concerns the content of some of its instruments, particularly the Experience Inventory. A number of the items are ambiguous. For example, students were asked to identify those experiences which "reinforced" their behavior and also those which "modified" it. There is some overlap in the denotative value of these two verbs; and one suspects that some of the respondents did not understand the difference. This suspicion is borne out by the subjects' responses. For instance, Group I females identified

as experiences which very much reinforced their behavior--being away from home and "bull sessions". These same two items also appeared in the five experiences most commonly cited by this group as very much modifying their behavior. Similar repetitions occur for the other groups.

Another ambiguous item, and noted as such by the authors, is a statement with which respondents are asked to agree or disagree: "A college education should place equal emphasis on academic and social development." p.58) To disagree allows no intrepretation of which area the respondent favors.

5. Some of the explanations offered by the authors for the findings are strained. For example, they remark that the fact that female seniors become less stereotypic than men as they progress through college may be due to the impact of non-academic experiences (cited by women as important). Similarly, the authors feel that since female students believe that non-academic experiences, especially peers, have had a profound impact on their attitudes, this explains why females become more emergent in their value orientation.

   To merely conclude that females are more influenced by other students and are, therefore, more outer-directed is circular.

   Another problem with such conclusions is that they are based on self-reported influences. While such data should not be discounted, the authors should be more sanguine about making recommendations that might form the basis for educational policy.

One of the most important contributions of this study is that females appear to be qualitatively and quantitatively more affected by their college experience than males; and it is quite possible that peer influence is a major one for the women. But this does not answer, but rather begs, the question: Why should such extra-academic influences be more important, if in fact they are, for women than for men? What makes females more responsive to their environment?

Another questionable conclusion posited by Lehmann and Dressel concerns the differences found between the sexes with regard to planned participation in local politics. For men, there were no differences between amount of college attended and their plans to participate in local politics. As women completed more college, however, they were more inclined to indicate plans to participate in politics at this level. The authors believe that such differences are possibly due to differing definitions of "local politics", men assuming that this means holding an elected office, while women interpret the phrase to imply activity in party work. Again the authors seem to be overstepping their interpretive jurisdiction, part of the problem being the interpretation of responses to vaguely worded items in the instruments.

In summary, the major criticisms of this study revolve around the organization and presentation of data and findings. Literary criticisms, notwithstanding, Changes in Critical Thinking Ability, Attitudes and Values Associated with College Attendance, along with its companion volume, Critical Thinking, Attitudes, and Values in Higher Education comprise a valuable contribution to the literature on the impact of higher education.

AUTHOR: Jean Walker MacFarlane

TITLE: Studies in Child Guidance

PUBLISHER: Society for Research in Child Development, National Research Council, Washington, D.C., 1938

MAJOR ISSUES:

For the future of society and particularly educational programs and practices, it is important to discover what factors lead to maladjustive patterns as a normal child develops. Long, thorough time studies of the growth and development of the same individuals in substantial numbers should reveal the variety of patterns or routes by which individuals arrive at similar or dissimilar, mature or immature chronological adult status.

At the same time, in order to facilitate healthy development, it is important that current child guidance procedures be assessed as they pertain to both preventive and therapeutic situations.

OBJECTIVES OF THE STUDY:

General Objectives:

1. To observe the development of adjustive and maladjustive patterns in normal children over time.
2. To test both preventive and therapeutic usefulness of current child guidance procedures.
3. To measure the predictive significance of various facets of human growth over time.

Specific Objectives:

1. To obtain information about the frequency and persistence of behavior and personality problems of a representative group of normal children at different age levels enrolled in pre-school therapeutic clinics.
2. To investigate relationships between a child's typical behavior and his physical and psychological endowments and environment.
3. To discover the bio-environmental factors associated with the presence or absence of such behavior.
4. To evaluate current assumptions concerning the relation between early emotional patterns and subsequent maladjustment.
5. To accurately predict adult personality and behavior characteristics.

6. To discover the degree of the impact, if any, of intensive-extensive discussions with parents about child-rearing procedures, family members' personality characteristics, family interpersonal relations, social status, etc. on a child's behavior.

7. To measure the reliability of various types of data obtained by the interview method to validate a methodology for sensible use of the material.

MAJOR HYPOTHESES:

1. No a priori hypotheses formulated.

2. This study was undertaken in order to chart the course of human development and provide empirical assessments which would generate hypotheses to test. This study is unique in the extent of data collected covering the life span and breadth of biological and personality characteristics studied.

DESIGN OF STUDY:

1. Longitudinal: 1928 - present; on-going
   Test-re-test on same sample from age 21 months to 40 years.

   a. Clinical approach: interviews and projective tests administered in a clinical setting or clinician visits to subject and subjective assessments made.

   b. Complete longitudinal data from 68% of the original sample.

   c. Follow-up data on 68% of original sample at age 30 and age 40. Missing data due to death, moving, incapacitation, etc.

2. Comparison of experimental and control groups as to the effects of pre-school guidance procedures. The two groups were matched for socioeconomic variables but the number of each group was not specified.

3. Data collection:

   a. Guidance group

      1. Retrospective interview with mother (when subject was 21 months old)

      2. Interviews with child, parents, and peers

   3. Retrospective recapitulation interviews with parents and subject (when subject was 17 years old)
   4. Recapitulation interivew with subject at age 30 (including comparison with spouse and current relationship with parents and siblings)
   5. Cumulative records of physical and mental development as well as personality patterns; family and situational data.

b. Control group

   1. Non-intensive inventory-type interview with subject and mother.
   2. Recapitulation interview at ages 17 and 30.
   3. Periodic physical and mental evaluations.

DESCRIPTION OF SAMPLE:

1. Size of sample - 248 normal children and their respective families (245).

   Age: birth to 40 years

2. Population: Every third child born in Berkeley, California within the 18 month period between January 1, 1928 and June 30, 1929.

3. Sex: male and female (proportions not specified)

4. Racial composition: 96% Caucasian, 3% Negro

5. Religious composition: most parents Protestant (percent not specified)

6. Sampling procedure

   a. Selected on an arbitrary ordinal basis from the birth certificate registry of Berkeley, California.

   b. Sample verification procedures: representativeness ascertained by comparing the guidance sample with the

Welch Berkeley survey sample and Covalt group.*

These three studies used identical techniques for gathering basic central core data; similar data analysis - cross validation; identical methods of quantification and analysis (e.g. personality appraisals via Q-sorting techniques).

7. Limitations of study due to sampling:

   a. All available Oriental families were excluded due to language difference.

   b. Half of the Negro families of the Survey were not available for guidance due to their moving away from Berkeley.

   c. There were fewer Catholics and Jews than any other urban group.

   d. Berkeley is an atypical community compared to the general United States population, in terms of the following:

      1. Low infant mortality
      2. Superior education of parents
      3. High occupational status of father
      4. Low per capita income
      5. More home ownership
      6. Fewer foreign-born parents

   e. Sample shrinkage over time. The sample at age 30 consisted of 169 subjects (68 percent) of the original sample. The similarity of socioeconomic distribution was retained. More subjects were lost from the control than the guidance group however so the shrinkage did not greatly affect representativeness.

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*Welch, F.M. A study of the socioeconomic status of four hundred and five Berkeley families in the years 1928 and 1929. MS

Covalt, A. Birth and developmental facts on all live births occurring in Berkeley from January 1, 1928 to June 30, 1929. MS

  g. Criteria of "basic" facts pursued was based on traditional convictions and controversial areas of theory and practice expanded and developed as the study grew.

  h. The sample is no longer representative of the current Berkeley population because of the differential population shifts in and out of the community since the original research sample was secured. In 1966, the Berkeley school population was 40.8% Negro; 50.3% Caucasian; and 7.9% Oriental.

INSTRUMENTS AND MEASUREMENT:

1. Medical records (e.g. pre-natal, cumulative health history).

2. Physical evaluation to measure physical development (e.g. anthropometrics, skeletal development, X-rays, body build picture, physical rating scale, diet summary, motor-strength-grip-thrust-dexterity; physiological-heart rate, blood pressure).

3. Projective tests designed to measure mental development.

    a. California pre-school tests I & II

    b. Stanford-Binet Intelligence Tests

    c. Wechsler-Bellevue Intelligence Test

    d. Gray's Oral Test

    e. Healy P.C. II

    f. Kuder Preference Test

    g. Rating scale for reactions (e.g. cooperation, effort, speed-facility, inhibition).

    h. T.A.T. stimuli

    i. Rorschach Test

4. Structured interviews of mother, subject, and teacher designed to measure:

    a. Personality and behavior characteristics

    b. Occupational interests

c. General "things you talk about".

d. Changing parental practice as a result of discussions with guidance counselors.

e. Home and family situation (e.g. interrelationships, discipline, subject's behavior at home, differences of opinion).

5. "Guess Who" reputation test given to classmates.

6. Staff ratings of observed behavior to measure frankness, friendliness, speech, mannerisms, tension, adjustment to self, adjustment to family.

7. School records obtained to measure:

   a. Scholastic standing

   b. Social behavior

8. Berkeley social rating scale developed by the staff designed to measure interests and attitudes.

9. Vocational preference tests developed by the staff designed to measure vocational interests.

10. Taussig scale designed to measure father's occupation.

11. Trifon scale designed to measure mother's personality.

VARIABLES STUDIES:

1. Subject Variables

   a. Health and physical development

   b. Mental development (e.g. intelligence)

   c. Personality patterns (e.g. independence; showing feeling; sensitiveness; physical timidity; fears, anxiety; negativism; imitability; competition).

   d. Occupational interests

   e. Reactions (e.g. cooperation, effort, inhibition)

   f. "Things you talk about"

   g. Habits and regime (e.g. family play relationships; school attitudes; "wishes to be"; habits related to sleep;

elimination; eating; health; sex; motor activity; social or asocial conduct).

Behavior and personality problems studied are related to: sleep (restlessness, dreams); elimination (diurnal and nocturnal enuresis); eating (insufficient appetite, food finickiness); sex (masturbation, excessive modesty); motor behavior (thumbsucking, nailbiting, mannerisms): speech (stuttering); social standards (lying, destructiveness); personality characteristics (negativism, fears, temper tantrums, etc.).

2. Environmental Variables - Family

   a. Socio-Economic Status (SES)

   As measured by size of family; age of parents; income level of parents at child's birth; nativity (U.S. versus foreign born) race and ethnic background of parents.

   b. Relations between family members (e.g. marital situation; strains and satisfactions in the home; patterns of showing affection and anger; closeness of bonds; styles of discipline; personality appraisals of family members).

   c. Economic aspects (e.g. income; expenditures; savings; debts; attitudes toward money).

   d. Health (e.g. heredity; health history; present health; attitudes toward health).

   e. Education (e.g. levels of education attained by parents; attitudes toward education).

   f. Leisure time activities (e.g. intellectual; artistic; shared or unshared).

   g. Child training (e.g. habits, similarities and dissimilarities in parental attitudes).

   h. Physical surroundings (e.g. house and grounds, neighborhood)

   i. Religion

   j. Background and personality traits of parents (same as 1.c.)

   k. Status of child in family (e.g. relative placement to siblings, first, second child, etc.).

   l. Parents' evaluation of clinical techniques (e.g.if parents thought guidance discussions were helpful and if parents behavior was modified as a result of the discussions).

3. Environmental Variables - School

    a. Scholastic standing (e.g. rank in class).

    b. Behavior (e.g. negative or positive behaviors in school).

    c. Social adjustment(student's relations with peers, teachers, administrators).

    d. Adjustment to scholastic achievement (e.g. how they reacted to failure or success).

    e. Attitudes toward authority and regulations.

STATISTICAL PROCEDURES:

1. Frequency distributions

2. Validity measures

3. Single variable correlations

CRITIQUE

1. No multivariate analyses were performed.

2. Descriptive codes used to classify interview material and inter-rater reliabilities not described. There is no indication that inter-rater reliabilities were established.

## MAJOR FINDINGS

### I. Personal Development

A. There is a significant relationship between certain problem behaviors and family variables.

1. Two out of the 48 critical ratios were significant above a magnitude of 3 for the relationship between SES and diurnal enuresis, food finickiness, excessive attention demanding (families of lower SES), and speech problems (families of higher SES).

2. Three out of the 48 critical ratios were significant above a magnitude of 3 for the relationship between education of mother and diurnal enuresis, temper tantrums, food finickiness (mothers of less schooling) and speech problems (mothers of more education).

3. Only 1 out of the 48 critical ratios was significant above a magnitude of 3 for the relationship between nervous instability in the mother and excessive attention demanding, negativism, (unstable mothers), thumbsucking and specific fears (mothers rated as stable).

4. Thirteen out of the 48 critical ratios were significant above a magnitude of 3 for the relationship between marital adjustment and diurnal enuresis, food finickiness, emotional over-dependence, excessive attention demanding, negativism, temper tantrums (homes where marital disharmony exists), nocturnal enuresis and thumbsucking (homes where marital harmony exists).

B. There is more unanimity of opinion among teachers, classmates, and self-estimates obtained regarding disapproved behavior than for acceptable behavior.

C. There is little sex difference reflected in the total number of behavior problems.

### II. Cognitive and Intellectual Development

A. The constancy of mental test performance between the control and guidance groups is similar at 21 months (.30, .30 respectively) and at 60 months (.77 and .65). The control group is slightly higher throughout.

B. Given undamaged genetic potential, mental growth is best facilitated by a supportive warm emotional environment together with ample opportunities for positive reinforcements of specific cognitive efforts and successes.

C. The longer the interval between two measurements of mental test performance, the lower the correlation and therefore the greater the change. The younger the child, the lower the prediction, suggesting a decreasing plasticity and rate of learning with age.

The following findings were reported in several studies based on subsamples of the Berkeley Guidance Study and the Berkeley Growth Study.

1. Bayley, Nancy, "Constancy and Variability of Mental Functions of Intelligence From Birth to 18 Years," Journal of Genetic Psychology, The Journal Press, 1949.
2. Bayley, Nancy, "Learning in Adulthood: The Role of Intelligence," Analysis of Conceptual Learning (Harris, ed.), Academic Press, Inc., 1966.
3. Honzik, Marjorie; MacFarlane, Jean; and Allen, Lucille, "The Stability of Mental Test Performance Between 2 and 18 Years," Journal of Experimental Education, 1948.
4. Honzik, Marjorie, "Developmental Studies of Parent-Child Resemblance in Intelligence ",Child Development, Society for Research in Child Development, 1957.
5. Honzik, Marjorie, "A Sex Difference in the Age of Onset of Parent-Child Resemblance in Intelligence," Journal of Educational Psychology, American Psychological Association, 1963.
6. Honzik, Marjorie, "Environmental Correlates of Mental Growth: Prediction From the Family Setting At 21 Months," Paper, 1967.

## I. Cognitive and Intellectual Development

A. The experiences of a child within the family during the first two years of life are related to the child's cognitive development

1. A daughter's mental test performance is accelerated in a milieu of parental harmony and lack of conflict while the son's mental development is negatively correlated with parental compatibility.

2. Mental growth is accelerated for children whose mothers are active and energetic (greater responsiveness to children's needs) while energy level of the father correlates negatively with test scores of both boys

and girls (possibly because he engages in activities outside the home and thus is not as stimulating to the children as the mother).

3. The physical status of parents and parent's social adjustment do not significantly correlate with the child's cognitive development.

4. Concern of the parent of the opposite sex appears somewhat more motivating to the child than that of the parent of the same sex.

    a. The closeness of the mother-son relationship is most predictive of boys verbal IQ test performance between ages 8 and 18 (.56). Verbal competency of the male is facilitated by a close relationship to the mother in the early pre-school period.

    b. Father's friendliness but not expressiveness of affection for his daughter is positively related to her intelligence.

    c. If the mother-daughter relationship is too close, the daughter's intelligence decelerates in later childhood.

5. Boys show greater acceleration than girls when the father is concerned with educational achievement and when there is parental satisfaction with father's occupation.

6. The child's own mental test scores at age 2 years correlates only .30 with his IQ at age 18.

B. There is no general factor of intelligence since changes with age reflect individual differences in rates of mental growth.

    1. Boys and girls are equally labile in their test scores no matter what level of intelligence.

    2. There is great instability of scores during the child's first 3 years. Mental test interage correlations for a 3-month period in infancy is .57 while the coefficient for the same sample is .92 for a 3 year interval during elementary school years. The correlation between pre-school and school age scores is -.29.

    3. There is a fairly constant level of intelligence by school age.

4. The consistency of children's intellectual status relative to each other is influenced very little by the use of different tests.

5. Both sexes show a positive correlation between IQ and maternal controlling behaviors.

    a. A girl's IQ is related more to parental ability and a boy's IQ is related more to early maternal behavior.

    b. Boys whose mothers were loving when they were age one year had low scores while those whose mothers were hostile and rejecting had high scores. Girls showed opposite correlations.

    c. School age correlations (between 5 and 18 years of age) show boys with loving mothers have high scores while those with hostile mothers have low scores. Mother's treatment of son within first three years has a lasting effect on intelligence.

    d. Positively evaluating, affectionate mothers correlate positively with boys' extroverted adjusted behavior at adolescence. These maternal behaviors negatively correlate with son's introverted adjusted behaviors. Correlations for girls = 0.

6. There is no sex difference in IQ's or mental growth rates but there is genetic sex difference in persistence of effects of early experience.

C. Although mental test scores after 4 years are relatively stable, there are some individuals at all age periods whose mental growth is irregular.

1. Mental test constancy between 21 months and 18 years depends on the age tested and the interval between tests. Group predictions are good over short age periods. Mental test score is increasingly predictive after the pre-school years.

2. Distribution of IQ's between 6 and 18 years of age:

    a. 60% change 15 or more points

    b. 33% change 20 or more points

    c. 9% change 30 or more points

    d. Only 15% show less than a 10 point change

    The maximum shift averages between 118 and 123.

3. According to the sample, changes in mental test scores tend to be in the direction of the family level (parental education and SES).

4. The occurrence of these fluctuations emphasizes the need for caution in the predictive use of only 1 or 2 test scores.

D. The trend toward parent-child similarities in intellectual ability as the child grows older is in a considerable part genetically determined.

1. All measures which reflect the ability of parents are intercorrelated to about the same extent (e.g. SES correlates with parents' education .73, and mother's and father's education correlates .74).

2. Mental test scores of children under 2 years old are negligibly related to parental mental ability.

3. Increasing parent-child resemblence in the ability of children reared by their own parents is similar to that of a group of children reared by foster parents.

    a. The final correlation between the amount of mother's education and children's mental test scores is only .35 for children raised with true parents; and .32 for adopted children which is less that 15% of the variance accounted for by this index of true mother's ability.

    b. Individual differences in foster childrens' scores are not related to foster mother's education at any age.

    c. The educational level of the true mother is a rough indication of intellectual ability and this capacity is somewhat genetically determined and transmitted to the child.

    d. The discrepancy between a foster child's IQ and true mother's IQ (e.g., 106 of child and 86 of mother)could be due to lack of a systematic measurement of true mother's intelligence and partly to the generally favorable environment of foster family.

4. The relationship of amount of education of father and children's test scores is only significant after 7 years (.40). The trend of age changes in the relation between children's mental test scores and father's education is similar in both Guidance and Control groups.

5. Intelligence scores have low predictive value since there are wide individual differences in ages at which the children achieved mental test standard scores which were comparable with parents standard scores.

E. Parent-child resemblances in ability scores occurs at an earlier age in girls than in boys.

1. Little or no resemblance exists between abilities of parents and their infants.

2. Father-daughter and mother-daughter correlation (i.e. between education of parent and daughter's IQ) is significant at 3 1/2 years. Father-son and mother-son correlation is significant at 5 years.

3. There is an increase in parent-son resemblance until 14 - 15 years old which suggests a maturing of mental functions in boys until middle adolescence.

4. Individual differences in mental abilities become stabilized earlier in girls than in boys.

   For both the Guidance and Control groups the parent-child correlation is positive and statistically significant at an earlier age in girls than in boys.

   This may be due to the fact that pre-school age girls are more cooperative and controlled in test situations than boys. General earlier maturing of cognitive function in girls may account for sex differences in age when parent-child resemblance in intelligence appears.

5. Paternal education is correlated higher than maternal education with daughter's IQ at all ages. There is a higher correlation between mother's education and son's IQ than father's education and son's IQ.

   These high opposite sex relationships in the Guidance Sample have not been found in other samples.

F. Sex linked factors of intelligence influence differential growth rates in IQ of young adults.

1. General growth trends in the increment or decrement in intelligence between 16 and 36 years of age.

    a. Males score higher on the verbal scale of the Wechsler-Bellevue and Wechsler Adult Intelligence Scales between 16-21 years but there is no sex difference on verbal scale at later stages between 26 and 36 years.

    b. Females consistently score higher on performance scales.

    c. The greater consistency over young adult age span among males is seen most clearly in vocabulary and general information.

    d. Wechsler scores on the longitudinal sample increase with age through 36 years on the verbal scale and remain stable with little loss of level on the performance scale after 26 years. There is a slight drop in scores of females after 26 years on several tests.

    e. In the verbal portion of the Wechsler scales, the more verbally constituted test, the more likely the subjects are to grow in the capacities tapped in the tests.

    f. California Pre-school Scale of Verbal Knowledge emphasizes sex differences in stability of IQ after age 4. Standard scores of 4 year olds correlate with full scale scores at all ages. Males have lower correlation with their scores in first 2 years and higher correlation with their scores after 4 years.

        Starting at age 16, females show marked drops in correlations with their 4 year scores. Pre-school verbal knowledge factors correlate positively with all of later IQ's for both sexes. Correlations between boys' pre-school verbal knowledge and the information test is .49 to .58 while girls correlated only between .09 and .35.

    g. By age 6, IQ's of both sexes are fairly stable. However, girls' test scores are relatively less stable after 16 years (due possibly to emotional factors or educational experience).

2. Intellectual potential for continued learning is unimpaired through 36 years, especially in the attainment of information and word knowledge.

3. Differences in motivation affects IQ and educational and occupational achievement.

   The correlation between IQ and occupation ratings for girls range from .04 to .46. This low correlation is possibly due to the small variability in educational level and the fact that only 1/3 of the women tested were employed and the occupational ratings only covered 3 areas.

   Females' achievement is related very little to their potential capacities.

   Boys correlation between educational level and IQ ranged between .67 to .79. The correlation between IQ and occupational level was .69 to .75. Thus, as this represents achievement status, males are achieving in accord with their mental abilities.

CONCLUSION:

There is a need for a comprehensive theory that not only accounts for results but that leads to an understanding of what must occur when for optimal cognitive development.

AUTHORS: Theodore M. Newcomb, Kathryn E. Koenig, Richard Flacks, and Donald P. Warwick.

TITLE: Persistence and Change; Bennington College and Its Students After Twenty-Five Years

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MAJOR ISSUES:

The social-scientific notion of "attitude" is usually understood to mean a predisposition or established psychological orientation toward a given subject or class of subjects. Attitudes are psychological attributes, but are not as fundamentally established or indelible as personality traits. Attitudes may change over time, or they may persist. Although the exact nature of attitude persistence or attitude change is not wholly understood, it is assumed that various factors, such as personality, behavior, perception, and environment, account in large measure for the persistence or change of attitudes. The educational experience of college students is assumed to be a principal environmental factor in the development, persistence and/or change of attitudes.

On the one hand, college and university educators commonly insist that undergraduate education should include experiences that could have the effect of changing students' values--extending their horizons, increasing their interest in the new and unfamiliar, inculcating a sense of excitement in ideas for their own sake. On the other hand, the growth of mammoth universities, and the increasing proportion of students in colleges that are urban, appear to be creating an increased sense of impersonality and anonymity that contravene the traditional assumptions about the importance of the academic community in liberal education (p. 8-9)

In the late 1930's and early 1940's, Professor Newcomb attempted to measure the impact of the educational experiences of women at Bennington College on the development of political attitudes. (cf. Personality and Social Change). In a follow-up study in 1960-61, Professor Newcomb interviewed Bennington alumnae to ascertain the extent to which political attitudes which were developed in college had persisted or changed, and to determine what factors accounted for such persistence or change. He also studied the attitudes of a more recent class of Benningtonians to show both similarities and differences in the patterns of change.

OBJECTIVES OF THE STUDY:

General Objectives:

1. To investigate the conditions under which what kinds of people maintain or change what kinds of attitudes, and in what directions.
2. To study institutional change at Bennington College over a twenty year period, and to determine the effects of those changes (if any) upon individuals' changes during their college years.

Specific Objectives:

1. To investigate the relationship between persistence in college and the persistence or change of political attitudes.
2. To compare the persistence of conservative versus liberal political attitudes.
3. To investigate the relationship between persistence or change of attitudes during college to persistence or change of attitudes after college.
4. To investigate the influence of post-graduation environmental factors on the persistence or change of political attitudes developed in college.
5. To investigate the influence of personality traits on the development and on the persistence and change of political attitudes.
6. To investigate the relationship between the maintenance of liberal or conservative political attitudes and the congruence of behavior with community social norms.
7. To investigate the effect of membership in a subculture of peers, whose social attitudes are incongruent with the prevailing community norms, on the persistence of political attitudes.
8. To investigate the relationship between the individual's attitudes and behavior congruent with prevailing social norms.

MAJOR HYPOTHESES:

I. Educational Development

A. There will be a positive correlation between persistence in school and liberal political attitudes.

B. Women whose attitudes deviate from the community norms* will have a higher attrition rate than those whose attitudes are congruent.

C. Among women whose attitudes are incongruent with the prevailing community norms, those who are associated together in a peer subculture will have a lower attrition rate than those not so associated.

*There are two kinds of community norms:

1. Instrumental norms (or what Newcomb calls "marginal" norms): which serve as the means of acceptance by the majority of the community. At Bennington the instrumental norms are those of tolerance and unconventionality.

2. Consummatory norms ( or what Newcomb terms "ideal" norms): which represent the goals of the community. At Bennington, the consummatory norms are those of individualism and intellectualism.

II. Personal Development (Social)

A. Changes in social attitudes are a function of the congruence between the individual's initial attitudes and the prevailing community norms.

1. Change toward instrumental norms (tolerance and unconventionality) will be more frequent among those initially incongruent in their attitudes toward instrumental norms than among the initially congruent.

2. Change toward consummatory community norms (individualism and intellectualism) will be more frequent among those initially congruent in their attitudes toward instrumental norms than among those initially incongruent.

B. Changes in social attitudes, particularly (1) the experience of questioning one's initial attitudes, and (2) the relationship with reference groups, in this case with one's peers, are a function of experience during college.

1. Change in the direction of acceptance of community norms will be greater among students who question their values.

2. The relationship between questioning and change toward community norms will be closer for students initially incongruent in their views than for those initially congruent.

3. Change in the direction of acceptance of community norms will be greater among students whose reference group is accepting of community norms.

    a. Change in the direction of unconventionality (a Bennington instrumental community norm) will be directly related to the reported unconventionality of Bennington friends.

    b. The relationship between change in unconventionality and reported unconventionality of Bennington friends will be closer for those initially incongruent in their views than for those initially congruent.

C. Changes in social attitudes are a function of membership in a subculture of peers whose attitudes are deviant* from (incongruent with) the prevailing community norms.

*The prevailing community norms at Bennington are contrary to the prevailing norms of the larger society. Hence to be a deviant within the college community means to continue to endorse the social attitudes of the larger society.

Not all the social deviants of the Bennington community are found within the deviant subculture; some do not associate with fellow deviants in the subculture. Newcomb calls the deviant students within the subculture the collegiate deviants; those who are not within the subculture are the noncollegiate deviants.

1. Collegiate deviants will tend to change their attitudes less than will noncollegiate deviants.

2. Collegiate deviants will tend to accord higher status to one another than they accord to noncollegiate deviants or to the dominant culture types.

II. Personal Development (Political):

D. There will be a significant positive correlation between persistence in college and degree of liberalism in political attitudes.

E. Political attitudes developed in college will tend to persist over time.

Students who are the most conservative in college will persist as the most conservative after college; students who were the most liberal in college will persist as the most liberal after college.

F. There will be a significant positive correlation between change of political attitudes during college and persistence of attitudes after college.

1. Those whose political attitudes changed toward conservatism during college will persist in conservatism more readily than those who remained conservative throughout college; those whose political attitudes changed toward liberalism during college will be more persistent in their liberalism than those who remained liberal throughout college.

2. Students whose political attitudes changed during college from conservative to liberal will be significantly less conservative in 1960 than women who remained conservative throughout college, (i.e. acquired liberalism persists).

G. Persistence of political attitudes is a function of environmental support.

Women whose post-college environment is supportive of (congruent with) political attitudes developed in college will show a higher persistence of attitudes than women whose post-college environment is incongruent with college attitudes.

H. Persistence of political attitudes after college is a function of personal orientation toward the collegiate community norms.

1. Among conservative women, those who were aware of their incongruence with the prevailing (liberal) community norms are more likely to change their political attitudes than are the conservative unaware women.

2. Among conservative women, those who are most negativistic (opposed to) community norms are less likely to change attitudes after college than those who are not.

3. Among conservative women, those who are aware and non-negative are most likely to change toward liberal attitudes after college; those who are unaware and negativistic are least likely to change.

4. Among liberal women students, those who are aware of their liberalism (during college) are less likely to become conservative after college than those who are unaware of their liberalism.

5. Among liberal women, those who are cooperative (involved in community issues) are less individualistic and hence more likely to change toward conservatism after college than those who were noncooperative.

6. Among liberal women, the unaware and cooperative are the most likely to change toward conservatism and the aware and uncooperative are the least likely to change.

I. Political attitudes are a function of personality traits.

There will be a significant positive correlation between conservatism in political attitudes and authoritarianism.

III. Intellectual and Cognitive Development

A. Increases in intellectualism and individualism (behavior congruent with prevailing Benningtonian community norms) will be more frequent among students whose initial social attitudes are congruent with the prevailing community norms than among those whose attitudes are initially incongruent with the norms.

B. A significant positive correlation will be found between "serious" reading (professional and intellectual literature versus homemaking or current events periodicals) and liberalism in political attitudes.

## DESIGN OF STUDY

1. Longitudinal (1935-1964) with test-retest on the sample; once upon entering college, a second time upon graduation, and finally a follow-up test 20 years later.

2. Follow-up interviews were conducted with 94 percent (138 of 147) of the graduating classes of 1938, 1939, and 1940 who were still living and for whom addresses were available.

   Follow-up questionnaires were sent to the other students who had participated in the original study: usable responses were received from 62.9 percent of this group.

3. Test of the 1960-61 Bennington generation: interviews with 101 students in 1961-62 and questionnaire administered to almost the entire student body.

## DESCRIPTION OF SAMPLE

1. Size: 138 of 147 (94 percent) of alumnae of the classes of 1938,1939, and 1940, who were still living and for whom addresses were available.

   207 of 329 (62.9 percent) of other Benningtonians who participated in the original study. (161 graduates; 168 non-graduates).

2. Population: Two generations of Benningtonians: 1936-42; 1959-62

3. Sex: Females only

4. Religious Composition:

| | |
|---|---|
| Protestant | 57% |
| Roman Catholic | 4% |
| Jewish | 39% |

5. Sampling procedure:

   a. Entire classes of 1938-40 used in original sample.

   b. Interview sample used in the retest study consisted of all available surviving members of the classes of 1938-40.

   c. Questionnaires given to the entire surviving members of the classes of 1936, 1937, 1941, and 1942.

6. Limitations due to sampling: Not all alumnae were living; of those that were living, not all participated.

INSTRUMENTS AND MEASUREMENT:

1. Questionnaire measuring political and economic attitudes, known as the Political Economic Progressivism Scale developed by staff, designed to measure political attitude.

   (A high score on this scale indicates politically "conservative attitudes").

2. Alumnae Interview Schedule: a structured, open-ended questionnaire developed by staff designed to ascertain:

   a. Post-college history.

   b. Educational and professional training since graduation.

   c. Types of employment and organizational activities.

   d. Interests, attitudes and behavior related to public issues.

   e. Political, economic and social attitudes, interests, and activities.

   f. Voting behavior.

   g. Opinions regarding major public figures and issues.

   h. Attitudes of husband and friends.

   i. Identification and involvement with Bennington College.

   j. Background information.

3. Mailed questionnaire developed by staff, designed to measure the same information as the Alumnae Interview Schedule, namely:

    a. Educational and vocational history

    b. Organizational interests and activities

    c. Voting preferences for the elections 1940-1960

    d. Husband's voting preferences

    e. Current issues

    f. Political attitudes (PEP scale)

    g. An evaluation of the respondent's educational experience at Bennington

    h. Fifteen items from the Omnibus Personality Inventory (OPI) to measure "liberalism" and "nonauthoritarianism"

4. Questionnaire, developed by staff, administered to 110 entering freshmen in summer of 1960 designed to measure:

    a. Student perception of the characteristics of Bennington

    b. Personal traits

5. Interviews with 101 members of Bennington students during 1961 and 1962, designed to measure:

    a. The nature of community norms

    b. Social pressures to conform to community norms

    c. The extent of "subcultures" of students with attitudes incongruent with community norms

    d. Personal values, attitudes, behavior and changes in same

6. Adjective Check List developed by staff administered to the students in the Fall of 1959 designed to measure:

    a. Student perceptions of the characteristics of Benningtonians

    b. Student perception of community norms and sanctions

7. The Omnibus Personality Inventory developed by the Center for Study of Higher Education, University of California at Berkeley, administered to the entire college in the Fall of 1959, and to all entering freshmen in Fall 1960, designed to measure:

   a. Autonomy: Nonauthoritarian thinking, need for independence, and impulse expression.
   b. Level of anxiety: Psychological adjustment, freedom from unusual amounts of anxiety.
   c. Tolerance for ambiguity, and orientation towards an experimental, inquisitive viewing of experience.
   d. Interest in artistic matters, preference for abstraction, reflective thought, etc.
   e. Social introversion: the style of relating to people.

8. Developmental Status Scale adapted from Webster and Heist (1959) designed to measure:

   Rebellious independence (e.g. unconventional attitudes)

9. 1960 Conservatism Index developed by staff designed to measure:

   Conservatism on current public issues (e.g. Do you approve of admitting Red China to the United Nations?)

VARIABLES:

1. Factors related to change and persistence of political attitudes in post-college period.
   a. Degree of political liberalism or conservatism while in college
   b. Perception of liberalism or conservatism
   c. Perception of prevailing community (political) norms in college
   d. Degree of change in political attitudes during college
   e. Degree of environmental support for political attitudes
   f. Personality characteristics
   g. Degree of acceptance of prevailing community (political) norms in college
2. Factors related to change and persistence of social attitudes during college.
   a. Degree of initial congruence between individual attitudes and prevailing social norms

b. Degree of questioning of one's values and beliefs while in college

c. Degree of identification with reference groups

d. Personality factors

e. Subculture of deviants

MAJOR FINDINGS:

I. Educational Development

A. Persistence in school and liberal political attitudes are significantly and positively correlated.

(Hypothesis I A confirmed)

B. Women whose attitudes deviated from the community norms had a higher attrition rate than those whose attitudes were congruent. Deviants had a drop-out rate of 40.4 percent as compared to a drop-out rate of only 29.3 percent for the congruents.

(Hypothesis I B confirmed)

C. Among women whose attitudes were incongruent with the prevailing community norms, those who were associated together in a peer subculture of deviants had a lower attrition rate than those not so associated. (23 percent of the collegiate subculture dropped out; 36 percent of the non-collegiate deviants dropped out. This difference was not statistically significant).

(Hypothesis I C rejected)

II. Personal Development (Social)

A. 1. Increases in tolerance and unconventionality were more frequent among those initially incongruent in their social attitudes than among those who were initially congruent.

a. 48 percent of the incongruent students reported a significant change in tolerance as compared with 35 percent of the initially congruent.

b. When change in unconventionality was measured by two administrations of the Developmental Status Scale, the incongruent students showed a mean change of +4.73 while the congruent students showed a mean change of +0.65.

(These differences were not statistically significant.)

(Hypothesis II A (1) rejected)

2. Increases in individualism and intellectualism were more frequent among students initially congruent in their social attitudes than among those initially incongruent.

(Hypothesis II A (2) confirmed)

B. Changes in social attitudes, particularly (1) the experience of questioning one's initial attitudes, and (2) the relationship with reference groups, in this case with one's peers, are a function of experience during college.

1. Change in direction of acceptance of community social norms was greater among students who questioned their values than among students who did not.

   When change toward unconventionality (as measured by change in Developmental Status) is taken as the measure of change in acceptance of community social norms, it was found that in all categories, those of high questioning had higher mean changes than those of low questioning.

(Hypothesis II B (1) confirmed)

2. The relationship between questioning and change toward community norms was closer for students initially incongruent in their views than for those initially congruent.

   The correlation between questioning and change among those initially incongruent was .36 ($p < .05$), whereas for the congruent group, the correlation was .13 (not significant).

(Hypothesis II B (2) partially confirmed)

3. Change in the direction of acceptance of community norms was greater among students whose reference group was accepting of community norms.

   Change in the direction of unconventionality was directly related to the reported unconventionality of Bennington friends.

The means and correlation coefficients indicate that change in unconventionality (as measured by the Developmental Status Scale) is directly related to the unconventionality of the student's friends.

b. The relationship between change in unconventionality and reported unconventionality of Bennington friends was closer for those initially incongruent in their views than for those initially congruent.

As predicted, the relationship was closer when students enter with incongruent (conventional) attitudes than when they enter with congruent attitudes.

(Hypothesis II B 3 confirmed)

C. Changes in social attitudes are a function of membership in a subculture of peers whose attitudes are deviant from (incongruent with) the prevailing community norms.

1. Collegiate deviants tend to change their attitudes less than do noncollegiate deviants.

Attitude change measured by mean change on two applications of the OPI showed that collegiate deviants had a mean change of +1.3 whereas the noncollegiate deviants showed a mean change of +4.8; ($p < .01$)

(Hypothesis II C 1 confirmed)

2. Collegiate deviants tend to accord higher status to one another than they accord to non-collegiate deviants, or to members of the dominant culture.

a. Using a variety of measures, such as nominations for community representative (rank-ordering six Bennington "types" in terms of the student's desire to be identified as a member of each), the authors concluded that collegiate deviants tend to give higher status to students who are visibly collegiate.

b. Only 13 percent of the collegiate deviants endorsed the dominant culture type ("Creative Individualist") whereas 87 percent endorsed other types. The majority preferred to be known as members of the Social Group (deviant subculture).

(Hypothesis II C 2 confirmed)

II. Personal Development (Political):

D. There was a significant positive correlation between persistence in college and degree of liberalism in political attitudes.

1. On self-evaluation measures, 51 percent of non-graduates identified themselves as liberal; 61 percent of the 1937, 1938, 1941, and 1942 graduates (questionnaire population) identified themselves as liberal; and 67 percent of the graduates of the classes of 1938, 1939, and 1940 identified themselves as liberal.

2. Voting Preference: 54 percent of the non-graduates voted for Nixon; 40 percent of the graduates voted for Nixon ($P < .025$).

3. Preference for eight public figures: Every one of these eight comparisons is in the direction of less conservatism for the graduates ($P < .001$).

4. Comparison of mean PEP scores: sophomores 69.4; seniors 62.4.

5. Attitudes on Public Issues: 25.6 percent of those completing 4 years were opposed to Medicare in 1961 as compared to 44.0 percent of those completing only 1 - 2 years.

6. Party Preference: Of the students who entered in 1937 and 1938, 53.2 percent of those graduating preferred the Republican party in 1961 as compared to 62.1 percent of those who did not graduate (1 - 2 years).

(Hypothesis II D confirmed)

E. Political attitudes developed in college persisted over time.

Students who were the most conservative in college persisted as the most conservative after college.

A variety of measures were used:

a. Correlation of PEP scores and 1960 Conservatism Index: (High PEP scores indicate high conservatism)

68 percent of those scoring above the median on PEP during college scored above the median on the 1960 Conservatism Index; 65 percent of those scoring below the median on PEP during college, scored below the median on the 1960 Index.

b. Correlation of PEP scores and 1960 Index of Favorability to Conservative Figures:

73 percent of those scoring above the median on PEP during college scored above the median on the 1960 Index of Favorability to Conservative Figures; 67 percent of those scoring below the median on PEP during college scored below the median on the IFCF.

c. Correlation of PEP and Index of Favorability to Non-Conservative (Liberal) Figures:

68 percent of those scoring above the median on PEP during college scored below the median on the 1960 Index of Favorability to Liberal (Non-Conservative) Figures.

72% of those scoring below the PEP in college scored above the median on the 1960 IFNCF.

d. Correlation of PEP and Vote in 1960:

61 percent of those scoring above the median on PEP during college voted for Nixon in 1960; 81 percent of those scoring below the median on PEP in college voted for Kennedy in 1960.

e. Correlation of PEP and Vote (1940 - 1960):

46 percent of those who scored above the median on PEP during college voted 5-6 times for the Republican ticket since 1940; 71 percent of those scoring below the median on PEP in college voted Republican no more than once between 1940 and 1960.

f. Relationship between self-report and objective measure of change:

57 percent of those who reported themselves as remaining conservative since college, were determined by objective measures to have either remained conservative or to have become more conservative; 67 percent of those who reported themselves as remaining liberal since college had by objective measures, remained liberal.

g. Comparison of PEP and description of political attitudes:

31 percent of those scoring above the median on PEP during college reported themselves as conservative and 20 percent as middle of the road; 82 percent of those scoring below the median on PEP in college reported themselves as liberal in 1960.

h. Comparison of Party preference in 1938 and 1960:

57 percent of those preferring Republicans in 1938 still preferred Republicans in 1960; 71 percent of those who preferred the Democratic Party in 1938 still preferred the Democratic Party in 1960.

i. Relationship between Party preference in 1938 and 1960 Conservatism Index:

67 percent of those preferring the Republican Party in 1938 scored above the median on the 1960 Conservatism Index; 61 percent of those who preferred the Democratic Party in 1938 scored below the median on the 1960 Conservatism Index.

(Hypothesis E 1 confirmed)

F. There was not a significant positive correlation between change of political attitudes during college and persistence of attitude after college.

Students whose political attitudes changed toward conservatism during college persisted in conservatism no more readily than those who remained conservative throughout college.

a. Relationship between change in attitude in college and 1960 Political Conservatism Index:

67% of those who changed to become more conservative during college scored above the median on the 1960 Political Conservatism Index; 67 percent of those who remained conservative throughout college scored above the median.

63 percent of those who changed toward more liberalism during college scored below the median on the 1960 Conservatism Index; 70 percent of those who remained liberal throughout college scored below the median.

b. Relationship between change of attitude in college and 1960 candidate preference:

33 percent of those who changed to become more conservative during college preferred Nixon in 1960; 65 percent of those who remained conservative throughout college favored Nixon in 1960.

78 percent of those who changed toward liberalism in college preferred Kennedy in 1960; 86 percent of those who remained liberal throughout college preferred Kennedy.

c. Relationship between change of attitude in college and party preference in 1960:

50 percent of those who changed to become more conservative during college preferred the Republican Party in 1960; 62 percent of those remaining conservative throughout college preferred the Republican Party.

81 percent of those who changed toward liberalism in college preferred the Democratic Party in 1960; 86 percent of those who remained liberal throughout college preferred the Democratic Party in 1960.

(Hypothesis F 1 rejected)

2. Students whose political attitudes changed during college from conservatism to liberalism were significantly less conservative in 1960 than women who remained conservative throughout college (i.e. acquired liberalism persists.)

   a. Comparison of attitude change in college with 1960 Political Conservatism Index:

   63 percent of those who became less conservative while in college scored below the median of the Political Conservatism Test whereas only 33 percent of those who remained conservative scored below the median.

   b. Relationship between change in college and 1960 candidate preference:

   78 percent of those who became less conservative voted for Kennedy; whereas only 35 percent of those who remained conservative voted for Kennedy.

   c. Relationship between change in college and 1960 party preference:

   81 percent of those who became less conservative in college preferred the Democratic Party in 1960; whereas only 38 percent of those who remained conservative preferred the Democrats in 1960.

(Hypothesis F 2 confirmed)

G. Persistence of political attitudes is a function of environmental support.

Women whose post-college environment is supportive of (congruent with) their political attitudes developed in college show a higher persistence of attitudes than women whose post-college environment is incongruent with college attitudes.

a. Relationship of wife's change in attitude and husband's political conservatism on 1960 Conservatism Index:

The average score of the husbands of women who changed toward more conservatism since college is significantly higher than the mean score of husbands of women who remained liberal since college.

The difference in mean scores of the husbands whose wives became more conservative and the husbands of those who became more liberal is statistically significant (p .001).

b. Husband's favorability to conservative figures as related to wife's change in attitudes:

67 percent of women who were conservative in college and subsequently became more liberal had husbands scoring below the median on Favorability to Conservative Figures, whereas 55 percent of women who were liberal in college and who subsequently became more conservative, had husbands who scored above the median on the Favorability to Conservative Figures.

c. Husband's choice in 1960 election as related to wife's change in attitude:

80 percent of women who were conservative in college and who subsequently became liberal, had husbands who voted for Kennedy whereas 55 percent of the women who were liberal in college and who subsequently became conservative had husbands who voted for Nixon.

d. Respondents who became less conservative after college reported their friends' attitudes were significantly lower on conservatism than those reported for the friends of the women who remained conservative (p .005).

e. Women who became more conservative after college reported attitudes for their friends that are significantly more conservative than those reported for the friends of those who remained non-conservative (p .005).

f. Friends of women who are not conservative are reported to be much less conservative than are the friends of the women who are conservative (p .001).

(Hypothesis G confirmed)

II. Persistence of political attitudes after college is a function of personal orientation toward the collegiate community norms:

1. Among conservative women, those who were aware of their incongruence with the prevailing norms were more likely to change their political attitudes than the women who were conservative but unaware of their incongruence:

   50 percent of the aware conservatives became more liberal after college as compared to 12.5 percent of the unaware conservatives.

   (Hypothesis H 1 confirmed)

2. Among conservative women, those who were most negativistic (opposed to) community norms were less likely to change political attitudes after college than those who were not:

   25 percent of the negativistic conservatives changed toward liberalism after college whereas 37.5 percent of the non-negativistic conservatives did.

   (Hypothesis H 2 confirmed)

3. Among conservative women, those who were aware and non-negativistic were most likely to change toward liberal attitudes after college; those who were unaware and negativistic were least likely to change:

   60 percent of the unaware and negativistic women became more liberal after college, whereas only 20 percent of the unaware and negativistic women did.

   (Hypothesis H 3 confirmed)

4. Among liberal women, those who were aware of their liberalism during college were less likely to become conservative after college than those who were unaware of their liberalism:

   25 percent of those who were aware of their liberalism became conservative after college; 33 percent of those who were unaware became conservative.

   (Hypothesis H 4 confirmed)

5. Among liberal women, those who were cooperative (involved in community issues) during college were more likely to change toward conservatism after college than those who were non-cooperative:

38 percent of the cooperative women became more conservative; 11 percent of the non-cooperative women became more conservative.

(Hypothesis H 5 confirmed)

6. Among liberal women, the unaware and cooperative were the most likely to change toward conservatism; the aware and uncooperative were the least likely to change:

   50 percent of the unaware and cooperative women became more conservative; none of the aware and uncooperative liberal women changed.

(Hypothesis H 6 confirmed)

I. Political attitudes are a function of personality traits.

There was a significant positive correlation between conservatism in political attitudes and authoritarianism.*

* Authoritarianism was measured by the California Authoritarian (F) Scale. A high score indicates low authoritarianism, hence the (F) scale in fact is a measure of Non-authoritarianism.

a. Correlation of F scale and 1960 Political Conservatism Index (-.67).

b. Correlation of F scale with 1960 Index of Favorability to Liberal Figures (+.54).

c. Correlation of F scale and Index of Favorability to Conservative Figures (-.50).

d. Correlation of F scale with preference of Democratic candidates ( +.52).

e. Correlation of F scale and PEP scores in college (-.44).

(Hypothesis I confirmed)

III. Intellectual and Cognitive Development

A. Increases in intellectualism and individualism were more frequent among students whose initial social attitudes were congruent with the prevailing community social norms than among those whose attitudes were initially incongruent:

1. 70 percent of the students who were initially congruent in attitude reported increases in individualism and intellectualism compared to only 11 percent of the initially incongruent.

(Hypothesis III A confirmed)

B. There was a significant positive correlation between "serious" reading and liberalism in political attitudes.

> 67 percent of the women who scored below the median on the 1960 Conservatism Index read three or more serious magazines regularly, whereas only 34 percent of those scoring above the median read as much serious literature.
>
> (Hypothesis III B confirmed)

CONCLUSIONS:

By 1960, the college had achieved a public image such that students' selection of Bennington was based on more realistic grounds. Entering freshmen were, in the main, as politically "liberal" as the older students. The college appears to have earned a reputation for welcoming individual differences and encouraging creativity and intellectual independence. It did attract a sizeable minority of freshmen who were rapidly absorbed into "deviant" subcultures, but the great majority of the new students understood the dominant norms of the community into which they were moving.

The 1959 freshmen did not, like those of their mothers' generation, differ from the "normative" seniors in direction, but in degree. They were already distinguished from freshmen women in most other colleges in ways approaching such norms as independence and conventionality. There was no possibility of conversion-like changes toward those norms; their changes, rather, accentuated already existing tendencies.

It may be important, also, that the content of typical attitude changes was quite different during the two periods. The earlier students' changes were in attitudes toward public concerns, and those of the later students toward personal ones. The persistence of graduates' changed attitudes toward public concerns was in part attributable to the effects of their attitudes on their subsequent selection and creation of supportive environments.

The authors conclude that dominant community norms at Bennington were and are potent. Depending on the correctness of prevailing college images, the effects of that potency are conversion-like (as typically in the 1930's) or reinforcing (as in the early 1960's) in nature. In either case, they observed (in the earlier instance) and predict (for the later period) that when the effects of the college environment have been powerful enough to influence individuals' self-images, and thereby to affect their subsequent environments, the college influences are likely to persist (p. 229-230).

CRITIQUE OF THE STUDY:

The authors' conclusion that the college environment was a powerful influence on the political attitudes of the students is unconvincing in light of the design of this study. No control groups were employed and as a result there is no way to determine if the change in or reinforcement of political attitudes during the college years is due to the effect of the college environment or to maturation which would normally occur during the college years. While it may be that the college interacts with and facilitates the maturation process, the relative effect of the college impact in this study was not assessed.

AUTHOR: Donald E. Super and Others

TITLE: Floundering and Trial After High School, Career Pattern Study: Monograph IV

PUBLISHER: Teachers' College, Columbia University, New York, 1967

MAJOR ISSUES:

While theories of vocational development have been previously formulated and the early exploratory stages of vocational development have been studied, there have been few attempts to study in any depth the vocational experiences of young people in the years immediately following school (ages 18 to 25). Critical issues that need to be explored pertain to the following questions: What are the dynamics of the vocational behaviors occurring in late adolescence in the so-called late exploratory, establishment, and early maintainence stages of career development? By what criteria is success in these stages to be judged? Is success in each of these stages related to abilities and behaviors identified during the junior high school and high school years?

This study, the fourth in a longitudinal Study of Career Patterns, builds on the work done in the first three Career Pattern Studies and extends and refines constructs used in these earlier studies.

OBJECTIVES OF THE STUDY:

General Objectives:

To describe at age 25 the careers of approximately 200 young men who attended a junior high school in a small city in the Eastern United States and to analyze the possible determinants of their vocational development.

Specific Objectives:

1. To identify vocational behaviors and to establish criteria for measuring these behaviors.

2. To establish criteria for measuring career and occupational success.

3. To describe the career and occupational behaviors and outcomes for the group of subjects in terms of the measures listed above. (1 and 2)

4. To use the vocational maturity data and the data from the standard school measures obtained at two earlier times (ninth and twelfth grades) in order to ascertain the valid predictors of career and occupational behaviors and outcomes at age 25.

MAJOR HYPOTHESES:

Each predictor variable was correlated with each criterion variable and the relationship was tested for significance.

A. Where it was considered theoretically or empirically justified, a priori hypotheses were indicated. They were not stated, however, but the hypothesized relationships and their directions were indicated by a plus or minus sign on a table showing relationships between the types of predictors and types of criteria. Several hundred of these relationships were indicated.

B. Where no relationship between a predictor and a criterion variable was hypothesized an exploratory test was undertaken to determine the possible existence of one.

C. Correlations between the following groups of predictors and criteria were computed and tested:

   1. 17 High School Vocational Maturity Measures and 8 Career Development Scales

   2. 17 High School Vocational Maturity Measures and Vocational Coping Behaviors

   3. 17 High School Vocational Maturity Measures and Career Statistics

   4. 17 High School Vocational Maturity Measures and Occupational Behaviors

DESIGN OF THE STUDY:

Longitudinal study of eighth and ninth grade students with follow-up on the same sample at age 24 or 25. Use is made of data collected in grades 9 and 12 in addition to the data collected at age 25.

1. The 12th grade data of the original 9th grade group is used to test a priori hypotheses and to explore unhypothesized relationships.

2. The 12th grade data of the original 8th grade group is used to test hypotheses derived from the exploratory analysis of unhypothesized relationships and to cross-validate findings hypothesized and verified in the first sample.

3. Availability of 9th grade vocational maturity data on the twelfth grade groups made possible the verification of the earlier predictability of young adult career behavior.

4. Availability of standard school measures for both 12th grade groups when they were in junior high school made possible the validation and cross-validation of these variables for both the 12th and 9th grade.

DESCRIPTION OF THE SAMPLE:

1. Size of sample:
    a. First sample: 103 subjects (originally part of the group which was studied in 1952-1953 when they were in the ninth grade. This group will be referred to as the ninth grade sample).
    b. Second sample: 88 subjects (originally part of the group that was in the eighth grade in Middletown Junior High School and who entered the ninth grade in 1952-1953. They are referred to as the eighth grade sample).
2. Population:
    a. Ninth grade: 140 boys enrolled in the ninth grade at Middletown Junior High School, Middletown, New York in 1951-52.
    b. Eighth grade: 114 boys enrolled in the ninth grade in Middletown Junior High School, Middletown, New York in September 1952 and who had attended eighth grade in that school.
3. Sex: All male
4. Religious composition: Not reported in this monograph.
5. Racial Composition: Not reported in this monograph.
6. Special Characteristics of the sample:
    a. Had been in the original study as ninth graders and had participated in the follow-up study as 12th graders.
    b. At age 25 (average) were willing to participate in the study by filling in the necessary questionnaires and to be interviewed.
7. Sampling procedure: No special sampling was done. This was a follow-up study and participation of all the original participants was sought. Intensive follow-up procedures, including letters and phone calls, resulted in 94% participation of the ninth grade group and 89% participation of the eighth grade group.

Limitation of the Sample:

This study included all boys who were in the ninth grade in Middletown high school in 1951-1952 and all the boys who were in the ninth grade in 1952-1953 except those boys who entered Middletown High School ninth grade from schools other than Middletown Junior High School. Thus nearly all ninth graders in the town during a two year period were studied. The generalizability of the study is limited only by the characteristics of the town. In 1952, Middletown was composed of 23,000 people 70 miles from New York City, and was a market center for a valley where the labor market was biased in favor of semi-skilled jobs. Between 1952 and 1962, the town did not grow in size although one or two new industrial assembly plants opened and there was continuing development of a community college, and additional highways connecting Middletown to other parts of the state were built. The town does not have the cultural and racial variety and heterogeneity nor the extremes of economic groups that are present in large urban areas.

INSTRUMENTS AND MEASUREMENTS:

1. The following instruments and measurements used in the 1962 analysis were selected from the 1952 data in order to describe relevant antecedent variables.

   A. 17 Vocational Maturity Indices*, specially devised for the early study, designed to measure the following:

      1. Specificity of Information Requirements: High School Background
      2. Specificity of Information Requirements: Training and Education
      3. Specificity of Information Requirements: Supply and Demand
      4. Range of Information: All Occupations, Requirements: High School Background
      5. Range of Information: All Occupations, Requirements: Training and Education
      6. Range of Information: All Occupations, Conditions of Work: Hours
      7. Range of Information: All Occupations, Opportunity: Supply and Demand
      8. Specificity of Vocational Planning
      9. Implementation of Vocational Preference in Selection of Relevant Extracurricular Activities

*The variables which these indices measure are defined under VARIABLES.

10. Interest Maturity (Strong Vocational Interest Blank)
11. Presence of Primary Interest Pattern I
12. Nature of Work Experiences: Self-Employment
13. Nature of Work Experiences: Auspices of Work
14. Socioeconomic Accessibility of Preferred Occupation
15. Socioeconomic Accessibility of All Occupations Under Consideration
16. Agreement between Intellectual Ability and Intellectual Requirements of the Preferred Occupation
17. Agreement between Intellectual Ability and Intellectual Requirements of All Occupations Under Consideration

B. Verbal Reasoning Test of the Differential Aptitude Test, designed to measure intelligence.

C. Hamburger Revision of the Occupational Rating Scale in Warner Index of Status Characteristics, designed to measure parental occupational level.

D. Modification of Warner's scale, designed to measure house value (on a scale from excellent to very poor).

E. Hamburger Revision of the Warner Scale, designed to measure level of subject's first vocational preference.

F. Revised Warner Scale, designed to measure agreement between level of aspiration and level of expectation.

G. Statement of high school curriculum, designed to measure educational expectations.

H. Questionnaire for parents, designed to ascertain parental vocational aspiration for their sons.

I. High School transcript, used as a measure of school achievement.

J. Regression equations computed on basis of intelligence and grades, designed to assess achievement vs. underachievement.

K. School Activities Questionnaire, designed to measure

1. number of activities engaged in for a minimum of two years
2. total number of activity years

    3. total number of activities regardless of duration

    4. average number of years of participation per activity

L. Out-of-School Activities Questionnaire, designed to measure extent and depth of participation in out-of-school vocational and avocational activities.

M. Peer Acceptance Questionnaire, designed to obtain peers' descriptions of subjects.

N. Biographical Inventory, designed to obtain information concerning: age, birth order, rural vs. urban residence and religious affiliation.

II. The following instruments were used in 1962 when subjects were age 25

A. Hamburger Revision of the Warner Scale, designed to measure parental occupational level and parental occupational mobility

B. Cultural Participation Scale from the Biographical Inventory, Form HAS, designed to measure the extent to which a subject has been engaged in activities or experiences which reflect awareness of the culture.

C. Independence Scale from the Biographical Inventory, Form HAS, designed to measure the degree to which an individual relies upon himself in setting goals and acquiring new skills.

D. Question on marital status, designed to assess married vs. not married.

E. Questionnaire-Interview Battery (QIB), an integrated battery of questionnaires and interview guides covering educational, military,and work histories, consisting of:

    1. Rotter Incomplete Sentence Test

    2. Work Values Inventory

    3. Strong Vocational Interest Blank

    4. Biographical Inventory

    5. Descriptions Inventory

    6. The Questionnaires:

        a. Time Sheet, a calendar of activities since the last contact

    b. Personal Data Blank
    c. Military Form
    d. Training and Education Form
    e. Job Cut-Off Form (brief form for all positions)
    f. Job Master Form (more detail for major jobs)
    g. Career Form E (evaluation)
    h. Career Form P (planning)
    i. Missing Data Form (if needed to fill gaps in information collected previously)

7. Interview guide which directed interviewer to check each questionnaire and probe more deeply in certain kinds of areas.

   (The QIB was designed to provide career statistics, data on education training, military service, employment and personal histories and to obtain data on subjects aspirations and self-evaluations.)

F. Seven Scales developed by the staff for the use of judges' ratings of QIB data include:

1. *Career Development Scale I: Change in Equity* designed to establish criteria for the degree of carry-over of pay rate, worker benefits and experience and training from one position to the next.

2. *Career Development Scale II: Realism of Subjects' reasons for moving*, designed to establish criteria for determining whether dissatisfying aspects of a job were or were not remedied by a move.

3. *Career Development Scale III: Improvement in Use of Abilities*, designed to compare subject's abilities with the abilities required for average performance in each job or training objective as rated in *Estimates of Worker Trait Requirements for 4000 Jobs* (U.S. Department of Labor, 1956 and *Revised Minnesota Occupational Rating Scales* (Peterson, Gerkin and Hahn, 1953).

4. *Career Development Scale IIIB: Improvement in Goodness of Fit in Terms of Measured Interests*, designed to assess a job in terms of subject's measured interests (SVIB).

5. Career Development Scale IV: Progress Toward Goal, designed to compare positions subject had held since leaving high school with goals stated at age 25.

6. Career Development Scale V A: Improvements in Socioeconomic Status, designed to assess discrepancy between employment level of the subject, the subject's family and his wife's family.

7. Career Development Scale V B: Improvement in Educational Level, designed to assess discrepancy between educational level of the subject and of father and father-in-law.

G. Additional judging procedures (not described), designed for rating career statistics, educational attainment and subjective career criteria.

H. Occupational Rating Scales designed for the rating of level of occupational behaviors and outcomes at age 25.

VARIABLES:

I. Antecedent variables: From 12th grade and 9th grade

A. Those derived from standard measurement instruments include:

1. Intelligence, defined as score on Verbal Reasoning Test of the Differential Aptitude Test.

2. Socioeconomic Status, defined as:

a. Parental Occupational level

b. House Rating

3. Level of Aspiration, defined as:

a. Boy's vocational aspiration level

b. Agreement between levels of vocational aspiration and expectation

c. School Curriculum

d. Presence of Parental Vocational Aspiration for Boy

4. Achievement, defined as:

a. School Achievement: Grades

b. School Achievement vs. Underachievement

    - c. Participation in School Activities (four measures)
    - d. Participation in out-of-school activities (six measures)
    - e. Peer Acceptance Score
- 5. Miscellaneous, including:
    - a. Age
    - b. Birth order
    - c. Rural vs. urban residence
    - d. Religious affiliation: Protestant
    - e. Religious affiliation: Catholic

B. Vocational Maturity, defined as the behavior of the individual in coping with the developmental tasks of his life stage compared to his peers. Scores given on the 17 indices measure the following:

1. Specificity of Information Requirements: High School Background, defined as the score on a scale assessing student's knowledge of the high school background required for his preferred occupation.
2. Specificity of Information Requirements: Training and Education, defined as the score on a scale assessing student's knowledge of the training and education needed after high school in order to enter his preferred occupation.
3. Specificity of Information Requirements: Supply and Demand, defined as the score on a scale assessing boy's knowledge of supply and demand information relating to his preferred occupation.
4. Range of Information: All Occupations, Requirements: High School background, defined as the score on a scale assessing a student's knowledge of the high school background required for entrance into all occupations.
5. Range of Information: All Occupations, Requirements: Training and Education, defined as the score on a scale assessing a student's knowledge of the training and education needed after high school in order to enter all occupations.

6. Range of Information: All Occupations, Conditions of Work: Hours, defined as the score on a scale assessing a student's knowledge of the working hours in all occupations.

7. Range of Information: All Occupations, Opportunity: Supply and Demand, defined as the score on a scale assessing a student's knowledge of supply and demand information in all occupations.

8. Specificity of Vocational Planning, defined as the score on an interview-derived measure of planning to qualify for the preferred occupation.

9. Implementation of Vocational Preferences in Selection of Relevant Extra-Curricular Activities, defined as the score on an interview-derived measure of participation in high school activities relevant to preferred occupation.

10. Interest Maturity, defined as the score on the interest maturity scale of the Strong Vocation Interest Blank.

11. Presence of Primary Interest Pattern I, defined as the presence of a clear-cut pattern of vocational interests.

12. Nature of Work Experience: Self-Employment, defined as working for oneself as opposed to working for an employer.

13. Nature of Work Experiences: Auspices, defined as assessment of the auspices (such as friends, parental friends, stranger) under which a boy worked.

14. Wisdom of Vocational Preferences: Socioeconomic Accessibility: Preferred Occupation, defined as accessibility of boy's preferred occupation, judged by its proximity to the parental occupation.

15. Socioeconomic Accessibility: All Occupations Under Consideration, defined as accessibility of all occupations which a boy is considering, judged by their proximity to the parental occupation.

16. Agreement Between Intellectual Abilities and Intellectual Requirement of Preferred Occupations, defined as judged agreement between a boy's measured abilities and the abilities required in his preferred occupation.

17. Agreement between Intellectual Abilities and Intellectual Requirement of All Occupations, defined as judged agreement between a boy's measured abilities and the abilities required by all occupations which he is considering.

## DEFINITIONS

1a. Floundering - Floundering is defined as movement to a position which is not logical as a next step from the position being vacated, for which the subject lacks required aptitudes, interests, and preparation, or for which he is no better suited than for the position being vacated.

1b. Trial - Trial is conceived of as movement from one related job to another, the next job having some characteristics of the preceding job but lacking others. The process appears as one of eliminating the inappropriate and retaining or gaining the appropriate, and may be described as a zeroing in on a field of activity. Trial should, in due course, lead to establishment; when it is too prolonged, or too frequent, it takes on the characteristics of stagnation or of floundering.

1c. Instrumentation - Instrumental behavior is action which enables, or is designed to enable the subject to prepare for or enter a regular adult occupation which is appropriate for him.

1d. Establishment - Establishment behavior is that which achieves stability in an occupation in which the subject can function as a normal adult or, in the case of some handicapped persons, in which one can come as close as possible to normal adult functioning. Establishment involves making a place for oneself in an occupation for which one has the required abilities and interests, and in which one can support oneself and dependents in ways deemed appropriate when socially defined.

1e. Stagnation - Stagnation involves staying in a position or in an occupation longer than is appropriate. In stagnating, the subject stays in an entry job after he should have moved on to a higher level at which he might achieve some security, earn enough to support himself and dependents, use his abilities and express his interests; he remains in a blind alley job despite the impossibility of self-support or self-fulfillment in it, hurting his prospects of getting started in a job with a future. Stagnating therefore means deteriorating.

The standards used in the assessment of all coping behavior may be internal and subjective or external and objective; they may be global or atomistic.

II. Criterion variables:

- A. Career and Occupational Behaviors and Outcomes
    - 1. Vocational Coping Behaviors
        - a. Floundering
        - b. Trial
        - c. Instrumentation
        - d. Establishment
        - e. Stagnation
    - 2. Scaled Career Behaviors
        - a. Equity Change
        - b. Realistic Reasons for Move
        - c. Goodness of Fit: Abilities
        - d. Goodness of Fit: Interests
        - e. Relation to goal
        - f. Status Improvement: Occupational, defined as discrepancy between employment level of subject, his family and his wife's family.
        - g. Status Improvement: Educational, defined as discrepancy between educational level of subject, his father and his father-in-law.
        - h. Career Development Total (sum of a, b, e, f, and g)
    - 3. Career Statistics
        - a. Number of Moves
        - b. Number of Times Unemployed
        - c. Number of Months Unemployed
        - d. Number of Months Self-Supporting
        - e. Educational Level Attained
        - f. Educational Level Comparison

g. Educational Success: College Grade-Point-Average

h. Career Satisfaction, Self-Estimated

i. Career Success, Self-Estimated

j. Career Establishment, Self-Reported

k. Attainment of High School Leaving Vocational Goal

4. Occupational Behaviors and Outcomes

a. Occupational Level Attained

b. Position Success, Self-Estimated

c. Position Success, Employer Rated

d. Occupational Success, Self-Estimated

e. Position Satisfaction, Self-Estimated

f. Occupational Satisfaction, Self-Estimated

g. Occupational Satisfaction, Self-Reported

h. Utilization of Assets, Self-Reported

i. Opportunity for Self-Expression, Self-Reported

B. Other Background Variables: 1962

1. Parental occupational levels: in 1962, defined as the rating of principal breadwinner's occupation on Hamburger Revision of the Warner Scale.

2. Family social mobility, defined as the difference between 1952 occupational level and that of 1962.

3. Cultural participation, defined as scores on a scale of the Biographical Inventory.

4. Independence, defined as the score on the independence scale of the Biographical Inventory.

5. Adjustment, defined as the score on an adaptation of the Rotter Incomplete Sentence Blank.

6. Marital Status, defined as married or single.

STATISTICAL PROCEDURES:

1. Descriptive statistics: response distributions, means and standard deviations.
2. "T" tests (one-tailed and two-tailed) and analysis of variance for testing significance of differences.
3. Pearson product-moment coefficients of correlation were computed between the continuous measures point biserial r's were computed between dichotomous measures and continuous measures and phi coefficients were computed between two dichotomous measures.

NON-STATISTICAL PROCEDURES:

1. Content analysis
2. Subjective, judgmental assessment

MAJOR FINDINGS:

I. Vocational Development

A. Description of Career Pattern Study Subjects at age 25

(The following figures apply to the 9th grade sample; the 8th grade sample does not differ significantly except on items 7 and 8)

1. Location:
    - a. 76% lived in the Northeastern United States
    - b. 68% lived in or near Middletown
    - c. 58% lived in Middletown or its immediate vicinity
    - d. 24% lived outside of the Northeast; if those in the military are excluded, only 9% are outside of the Northeast
2. Educational attainments by 1962:
    - a. 85% had graduated from high school although not all had graduated on schedule
    - b. 46% had had some post-high school education
    - c. 26% finished 2 years of college or of technical training

   d. 17% graduated from 4 year colleges

   e. 11% went beyond the bachelor's degree

   f. 4% obtained the Masters' degree or equivalent

3. Ability level:

   a. College graduates: Median IQ was 112

   b. Less than 4 years of college: median IQ was 106

   c. No college: median IQ was 98

4. Parental Occupational Level and Vocational Aspiration Level

   a. Subjects who had no college were at least one step lower on a seven point scale than subjects who had some college education.

5. Employment Status in 1962

   a. 65% were employed by others

   b. 3% were self-employed

   c. 5% were job hunting

   d. 11% were not in the labor market

   e. 16% were in the military

6. Level of employment of graduates, diploma equivalents, and dropouts.

   a. 74% of the high school graduates were employed at a professional, semi-professional or skilled labor level

   b. Percentages are not given for the others. Inspection of the table reveals that those receiving the equivalent of a diploma or who dropped out were employed mostly at the semi-skilled and unskilled level; none were above the semi-professional level.

7. Self-Rated Occupational Success

| | Grads | Equiv. Dip. | Dropouts |
|---|---|---|---|
| a. Above average | 26% | 29% | 28% |
| b. Average | 65% | 64% | 67% |
| c. Below average | 10% | 7% | 6% |

8. Self-Rated Career Success

| | Grads | Equiv. Dip. | Dropouts |
|---|---|---|---|
| a. Above Average | 45% | 33% | 44% |
| b. Average | 43% | 40% | 31% |
| c. Below Average | 12% | 27% | 25% |

9. Career Statistics

    a. Average number of moves in 7 years: 6

    b. Average amount of time self-supporting: 5 years

    c. Number of subjects unemployed at some time: one-third

    d. Amount of time unemployed per time: less than 4 months

B. The relationships between 17 measures of Vocational Maturity and the 8 Scaled Career behaviors were determined as follows:

1. Occupational Information when defined as information concerning training and education requirements for both preferred occupations and all occupations of interest was a good predictor of both realism of reasons for changing positions and improvement of educational status.

2. Planning to qualify for the preferred occupation in grade 12 was related to realism of reasons for changing positions.

3. Interest maturity in the 12th grade was related to improvement in educational status.

4. The nature of high school work experience was not related to post high school career development although in junior high school it may be predictive of less post-high school education.

5. Wisdom or realism of vocational preferences as shown by agreement between actual abilities and those required by various occupations of interest in 12th grade was a good predictor of realism of reasons for changing jobs.

C. The relationship of measures of Vocational Maturity to judged Vocational Coping Behaviors from the time of leaving high school to age 25 were determined to be as follows:

1. Occupational information, defined as knowledge of needed high school background or as knowledge of needed training and education, for either the preferred occupation or for all occupations, was related to stablizing or

floundering career behaviors (as hypothesized) in one sample but not in the other.

When defined as knowledge of supply and demand in preferred occupations and occupations of interest, occupational information was related to stablizing or floundering in both replication samples.

2. Planning to qualify for the preferred occupation while in 12th grade, but not in 9th, was related to positive-negative career behaviors.

3. Interest, as measured by the maturity scale of the SVIB in the 12th grade, but not in the 9th, was consistently related to socioeconomically judged stabilizing career behavior after high school; having high scores in one or more occupational fields (primary interest patterns) was not so related.

4. The nature of senior high school work experience appears to have a somewhat inconsistently low but positive relationship to the stabilizing-floundering quality of early adult career behavior; the relationship is less tenuous for self-employment than for the type of auspices under which those employed for others work.

5. Wisdom of vocational preferences, measured by agreement between actual and required abilities in preferred or all occupations was related to floundering-stabilizing behavior after high school in one group but the finding was not supported in the replication group.

6. Predictions reported in this section suggest that external social and psychological standards for judging the positive-negative quality of early career behavior are about equally predictable criteria, and that internal psychological standards appear to be equally as good.

D. The relationships between measures of Vocational Maturity and Career Statistics were determined as follows:

1. Occupational information was not related to post-high school employment history as reflected in career statistics.

2. Planning, judged by high school-made plans to qualify for the preferred occupation was not related to post high school employment history as measured by job change, by unemployment and by self-support. It is related to the educational level attained after leaving high school and in the twelfth grade it predicted the quality of that study as shown by grade point average.

Planning in the 12th grade and in the 9th grade was also related to self-estimated career establishment, success and satisfaction. Implementing a vocational preference by participating in relevant high school activities was not related to any career statistics reported.

3. Inventoried interest as judged by maturity and patterning was not related to employment history, and patterning was unrelated to any career statistic reported. Interest maturity in both junior and senior high school was related to educational level attained after high school and to self-estimated career satisfaction. In the 12th grade only it was related to grades after high school and to self-estimated success and to career satisfaction.

4. Work experience was not related to post-high school employment history nor to educational attainment or to career success after high school. Having been self-employed while in high school was slightly related to career satisfaction at age 25.

5. Wisdom of vocational preferences in high school, whether judged by socioeconomic or ability standards, had such a low relationship in one sample and none in the other that it must not be a valid predictor of success in handling the first few years of a post-high school career.

6. The most predictable career statistics at age 25 when Vocational Maturity measures are used as predictors, were educational level attained and career satisfaction. The next strongest predictors were quality-grade-point-average in college or technical school and self-estimated career establishment.

E. Relationships between measures of Vocational Maturity and later Occupational Level and Outlets.

1. Occupational information in senior high school was positively related to occupational level attained by age 25 when judged by knowledge of high school background and particularly of training and education needed. A relationship between these factors and utilization of assets and opportunity for self-expression in occupation were found in one sample only.

2. Planning to qualify for the post-high school preferred occupation was related to occupation at age 25 in one group but not in the other. Implementation of preferred occupation in relevant high school activities was not related to occupational level and outlets.

3. Auspices of work experience was related to opportunity for self-expression in the young adult. It was not related to occupational level or to utilization of assets.

4. Wisdom of vocational preferences in high school was not related to any occupational level or outlet criteria.

5. The only strong predictor was the interest maturity measure (SVIB) which appeared to be strongly related to occupational level in all groups.

F. Relationships between measures of Vocational Maturity and Position and Occupational Success and Satisfaction.

1. Occupational information, specifically of training and education requirements for the preferred occupation, was related to occupational satisfaction at age 25; no other consistent relationship between occupational information and the career criteria were observed.

2. Planning to qualify for the preferred occupation was related to occupational satisfaction in one group but could not be validated in the second group.

3. Interest maturity in the 12th grade was related to occupational satisfaction at age 25 but not to any of the other criteria. Primary interest pattern was not related to any of the criterion measures.

4. The nature of work experience during high school, as assessed by working for oneself or working for others and by the independence of the auspices of employment was unrelated to position or to occupational success and satisfaction.

5. The wisdom of vocational preferences in high school, judged by socioeconomic standards was not related to occupational success and satisfaction at age 25; agreement between actual and required abilities was slightly related to occupational satisfaction.

6. Among the occupational success and satisfaction criteria, occupational satisfaction was the most predictable by means of measures of vocational maturity.

G. Relationships between Standard School Measures and Career Behaviors and Outcomes

1. Intelligence was consistently and moderately correlated with career criteria such as realism of reasons for changing positions during the post-high school year, improvement in educational status during the

same period, educational level attained, occupational level at age 25 and occupational satisfaction at age 25. It tended also to be related to stabilizing as contrasted with floundering career behavior and to quality-grade-point-average in post-high school education.

2. Parental occupational level when the student was in either junior or senior high school was found to be related to the same criterion variables as was tested intelligence and to about the same degree. It predicted a number of criteria, specifically realism of reasons for changing position, stabilizing vs. floundering career behavior and occupational satisfaction at age 25, for the 9th grade sample but not for the original 8th grade sample. In the latter sample it predicted the number of months of self-support after leaving high school.

3. Vocational aspiration level in the 12th grade was a consistently fair predictor of educational and occupational levels attained by the age of 25 and of realism of reasons for changing positions during the inventory years. In the original 9th grade group, but not in the 8th, vocational aspiration level was positively related to these variables even when assessed in junior high school. It was related to stabilizing vs. floundering during the post-high school years in the original eighth grade sample when assessed in the 12th grade.

4. Curriculum pursued was rather consistently related to realism of reasons for changing positions, improvement in educational status after leaving high school, and to educational and occupational level attained by age 25. Curriculum predicted stabilizing only in the first sample, at both junior and senior high levels, and it also predicted later occupational satisfaction in the same group. In the second sample, it again predicted self-support during the post-high school years.

5. Grade point average in junior as well as in senior high school was a moderately good and consistent predictor of realism for changing position, educational improvement, educational and occupational levels attained, grades in post-high school education and occupational satisfaction. It did not predict stabilizing or floundering career behavior after high school.

6. Age-in-Grade was a consistent predictor of educational and occupational levels attained at age 25. It did not predict stabilizing or floundering in either sample and was related to career criteria such as realism of reasons for changing positions, educational improvement after high school and self-support only in the original 9th grade sample at both 9th and 12th grades.

7. Participation in high school activities was consistently related to realism of reasons for changing position during the post high school years, to educational and occupational levels attained by age 25, and to stabilizing or floundering career behavior. It was related to other criteria, however, in an inconsistent way.

8. Participation in vocationally relevant out-of-school activities, showed no consistent relationship to any of the early career criteria; avocational out-of-school activities, however, were consistently related to educational and occupational levels attained by age 25, to post-high school quality-grade-point-average, and to number of times unemployed after high school. Out of school activities were also related, in expected ways to stabilizing or floundering career behavior in the original ninth grade sample, but not in the original eighth graders.

9. Concomitants of Vocational Development at age 25: Several variables which were studied earlier as possible predictors, were assessed when the Career Pattern Study subjects were about 25 years old, at the time of the collection of criteria data. The results indicated that:

   a. Parental occupational level and cultural participation were moderately related to many vocational development criteria.

   b. Family social mobility and independence as a child and youth were not related to success or satisfaction.

   c. Adjustment and marital status at age 25 showed a few significant relationships the former of a positive, and latter of a more doubtful, negative type.

H. Career and Occupational Behaviors and Outcomes:

1. Results of Judging and Scaling Procedures:

    a. Analysis of Career Development Scales revealed three related characteristics of positive vocational movement: increasing occupational equity, having realistic reasons for moving, and attaining higher levels of education.

    b. The groups did not appear to be moving toward jobs more appropriate to their abilities and measured interests.

    c. Analysis of judgments of behaviors exhibited in moves indicated that about 50% of the moves were floundering, over 33% were trial and the remainder were instrumental or establishing.

    d. Evaluation of career status at age 25 indicated that the majority were functioning positively, that is, were engaging in trial or instrumental or establishing behavior.

    e. Scores on 5 of the 7 scales measuring vocational behavior were positively related to independent judgments of the behavior. The numerical measures which discriminated between vocational floundering and trial were shown to be: change in equity, number of realistic reasons for moving, progress toward goal, and improvement in socioeconomic and educational levels.

2. Summary of objective (job getting and holding) and subjective (satisfaction and success) career behaviors and outcomes:

    a. Frequent job and training movement did appear to reflect repeated occupational dissatisfaction.

    b. Subjects' evaluations of their careers were apparently not related to unemployment or continuous financial self-support.

    c. Self-estimated career success was related to subjects' own attained educational levels, but not to comparisons between their levels and those of their fathers.

    d. Relationships between quality-grade-point-averages, attainment of high school leaving goals and positive career evaluation were not clearly demonstrated.

e. The only findings of intercorrelations among objective career variables which appeared in both samples were positive correlations between numbers of moves and number of times unemployed and between subject's educational level and the comparisons of his level with his parents' level, both of which are artifacts due to the nature of the measures.

f. Subjective measures were positively and highly intercorrelated because of measurement artifacts. (Subjective measures are the self-estimates of career establishment, success and satisfaction.)

I. Summary of Occupational Behaviors and Outcomes

1. Subjects who attained higher occupational levels expressed more satisfaction with their present occupation, felt they were successful in their fields and that their assets were utilized in their jobs.

2. All measures of satisfaction (position, occupation, utilization of assets and opportunity for self-expression) were positively intercorrelated in both samples.

3. The success measures (position and occupation) were positively intercorrelated with all other subjective measures except for three measures of satisfaction.

J. Summary of career vs. occupational measures

1. Subjects who felt their assets were utilized in their jobs tended to have made the least number of moves and to have been continually self-supporting.

2. Subjects attaining higher occupational levels had more years of advanced schooling, high grade point averages, and planned to continue in their present occupations. Subjects with high grade point averages also expressed more satisfaction with their present fields.

3. In general, subjects' ratings of their success and satisfaction with their careers paralleled their ratings of their occupations and positions.

K. Meaningful criteria: career behaviors

1. Objective criteria:

a. In both groups, subjects making the largest number of job or training moves tended to have made the lowest scores on all the scales except III A and III B. In both samples, subjects having the greatest loss in equity per move and the least realistic reasons for moving tended to have been unemployed more often and for longer periods of time.

b. Subjects who attained high levels of education tended to have more realistic reasons for making career moves and to have been judged to be functioning in a positive way at age 25.

c. There was no significant relationship between subject's educational level in comparison to parents in the ninth grade sample; there was a significant relationship in the eighth grade sample.

d. Subjects in both groups who had higher college grade point averages tended to have more realistic reasons for career moves.

e. Subjects who at one time entered one of the occupations they specified in high school tended to score higher on realistic reasons for moving.

2. Subjective criteria

a. Self-estimates of career establishment in both samples were positively related to the number of reasons for moving, progress toward goal and judged career behaviors.

b. Subjects in both samples who felt they had made progress toward their goals tended to have maintained or increased equity, had more realistic reasons for changes, increased the educational level for each move, and their career behavior at age 25 tended to be judged as positive.

L. Meaningful criteria: occupational behaviors

1. Objective criteria:

a. Subjects in both samples who attained higher occupational levels also tended to have increased their equity and educational level per move and to have given more realistic reasons for their moves. Their status at age 25 tended to be judged as stabilizing.

2. Subjective criteria:

   a. Self-estimated position success was not significantly related to any scaled or judged career behavior in either sample.

   b. Neither educational nor socioeconomic level were related to feelings of success.

   c. The remaining occupational behaviors were positively related to Scale II, number of realistic reasons for career moves, with the exception of position satisfaction and opportunity for self-expression. Position satisfaction and both measures of occupational satisfaction were related to progress toward goal.

   d. All measures of occupational behavior, except position success were positively related to the judgments of career behavior at age 25.

M. Meaningful criteria: occupational and career success

1. The analysis of the intercorrelation of the various developments and success measures has shown that they fall into eight clusters; of these, six seem to be logically meaningful.

   a. Career satisfaction criteria, including self-estimates of career establishment, career success, career satisfaction, occupational satisfaction and utilization of assets.

   b. Self-improvement criteria, including objective of educational level attained, improvement in educational status after high school, realism of reasons for changing position, and occupational level attained.

   c. Job getting and holding criteria, consisting of number of times unemployed and number of months unemployed.

   d. Economic self-sufficiency criteria, consisting of an objective measure of self-support after leaving high school and a self-estimate of occupational success.

e. Early establishment criteria, a cluster of three measures assessing improvement of socioeconomic status by age 25, attainment of the occupational goal set at age 25, and (negatively weighted) number of position changes since leaving high school.

f. Occupational satisfaction criteria, which included self-estimates of opportunity for self expression, occupational satisfaction, position satisfaction, utilization of assets, objective measures of occupational level attained by age of 25 and stabilizing vs. floundering behavior at that same age.

CONCLUSIONS:

1. Conceptually and empirically adequate measures of vocational maturity appear to be those which assess a boy's knowledge of education and training requirement for the occupations in which he is interested together with certain other aspects of information. This may be so,not so much because the boy will use those facts, but because the possession of such information indicates an orientation to the world of work which will help him in making vocational decisions based on data. Planning is important for the same reason but less so. Interest maturity, as measured by SVIB is also empirically sound as a measure of vocational maturity and conceptually adequate because it measures similarity of interests to those of older more mature males.

2. One impressive finding is the predictive validity which conventional school variables have for occupational and career as well as for educational criteria. Even 9th grade data of this type yielded correlations of .25 to .35 with young adult criteria. Parental socioeconomic level still plays an important part in vocational development. One interpretation that can be given to the predictive validity of these variables (social status, intelligence, grades, and participation in school and community activities) is that boys who are given opportunities in school and out-of-school and who use these opportunities during their school years, tend also to make good use of their later career opportunities.

3. Some of the presumed measures of vocational maturity such as the wisdom or realism and consistency of vocational preferences failed to have predictive validity in either the 12th or the 9th grade.

4. By age 18 (12th grade) vocational developments appear to have progressed far enough so that information concerning the preferred occupation, planning and interest maturity are related to vocational coping behavior at age 25.

5. It appears that vocational development of 8th and 9th graders has not progressed sufficiently for directional decision-making. Even in the 12th grade there is only a limited basis for sound directional decision-making in most students. Apparently, exploration is more relevant than training.

6. A conceptually and empirically adequate definition of success appears, on the basis of the findings in this study, to involve two criteria:

    a. Self-improvement - moving up the educational and occupational ladder with realistic reasons for each move; and

    b. Satisfaction with the occupation in which one is engaged, with the outlets available for one's abilities, interest and experience; and with the way in which one is handling the sequence of steps involved in pursuing a career.

7. It appears that while there is some utility in the career-occupational dichotomy, it is not empirically neat. (See finding number M. The first and second clusters are largely career but partly occupational; the fifth is largely occupational but includes one career criterion; the fourth includes both; the third and sixth are rather clearly career.) The lack of neatness may be due to defects of the measurement procedures rather than in the logic of the categories.

# PROJECT TALENT

Each of the Project Talent studies described in this section are based on subsamples of the regular Project Talent probability sample. The concept of a probability sample, the nature of the regular sample and procedures by which it was selected are presented as follows:

1. The concept of "probability samples":

   The use of a probability sampling procedure is the best way of insuring that unbiased estimates of population values can be obtained.

   The term probability sample refers to a sample chosen in such a way that the following conditions are met:

   a. The *a priori* mathematical probability of inclusion in the *sample must* be known for every member of the population;

   b. For every member of the population this *a priori* probability must be greater than zero. That is, *every member* of the population must have *some* chance of being included in the sample.

   The probability of selection does not have to be the same for all members of the population. The probabilities merely have to be known and greater than zero. It is possible in the data analysis stage to correct for differential probabilities or differential sampling ratios by differential weighting of the cases.

2. Nature of the Sample:

   The regular Project Talent sample consisted basically of all of the students in grades 9, 10, 11 and 12 attending between four and five percent of all secondary schools in the United States. The high schools selected were a stratified random sample of all senior high schools, and the associated junior high schools. The stratification variables were:

   a. Broad category of schools: public, parochial, and private

   b. Geographical area: 56 strata were used consisting of the five cities with populations in excess of 1,500,000 (New York, Chicago, Los Angeles, Philadelphia, Detroit); the District of Columbia; and the 50 states (with the five large cities named above removed)

   c. Size of senior class (for public schools only)

   (1) under 25 seniors

(2) 25 - 99 seniors
(3) 100 - 399 seniors
(4) 400 or more seniors

d. Retention ratio (public schools only):

The ratio of number of graduates (in the 1958-59 school year) to number of tenth-graders (in the 1957-58 school year)

3. Sampling Procedures:

Differential sampling ratios were used for the different school size strata (undersampling the smallest public schools, oversampling the largest ones, and correcting the resultant data through the use of differential school weights). The following sampling ratios were used:

| Schools | | Sampling ratio |
|---|---|---|
| Public schools | - less than 25 seniors | 1:50 |
| Public schools | - 25 - 399 seniors | 1:20 |
| Public schools | - 400 or more seniors | 1:13 |
| Parochial schools | | 1:20 |
| Private schools | | 1:20 |

Exceptions to the procedure occurred in New York City and Chicago. In New York City every senior high school and every junior high school participated; only one out of every 12 students were tested in each school. In Chicago, 20 out of 38 academic and technical high schools were selected and one-tenth of the students in every grade in every selected school were tested.

Throughout the sampling process, where randomization was required, it was achieved in every instance through the use of random numbers.

4. Size of the Sample:

a. Institutions:

The resultant sample consisted of 1,063 senior high schools, together with the associated junior high schools.

Of the 1,063 invited schools, 987 agreed to participate (93% acceptance rate); 238 junior high schools participated making a total of 1,225 schools.

TABLE II - 1

Number of Sampling Units that Participated or Declined to Participate in Project Talent.

| | Number of senior high schools | | | |
|---|---|---|---|---|
| | Public | Parochial | Private | Total |
| Participating | 822 | 114 | 51 | 987 |
| Declined | 57 | 11 | 8 | 76 |
| | 879 | 125 | 59 | 1,063 |

b. Students:

A total of nearly 400,000 students in grades 9 - 12 were tested in the sampled schools.

5. Division of the regular sample into subsamples:

For use in analyses where the total regular sample would not be required, the 987 high school sampling units were divided into ten subsamples which were as closely equivalent as could reasonably be achieved in terms of the stratification variables. Junior high schools were assigned to the same subsamples as the senior high schools with which they were associated. Where junior high schools were not directly associated with any specific senior high schools (such as those in New York City), the school was assigned to a subsample on whatever other basis seemed reasonable in order to maintain the qualitative and quantitative equivalence of the ten subsamples.

The ten approximately equivalent subsamples into which the 1,225 junior and senior high schools were divided were designated subsamples 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9.

AUTHORS: Flanagan, John C., *et al*.

TITLE: Project Talent, Studies of the American High School, Monograph 2

PUBLISHER: University of Pittsburgh, Pittsburgh, Pennsylvania, 1962

Sample:

The findings are based on a sample of 822 public senior high schools. Each of these schools completed the Guidance Program Questionnaire.

In addition, 1,117 counselors (school personnel who spent 20% or more time in counseling) responded to the Counselor's Questionnaire.

Useable responses were received from 100% of the participating public senior high schools. Several of the analyses, however, were based on a return of 90% of the participating schools since approximately 10% of the returns were too late for inclusion in this report.

The returns for both of the Questionnaires were weighted to reproduce the national population of guidance programs and the population of counselors.

Data Analysis:

The raw data were weighted to reproduce the population of schools from which the sample was drawn, within the limits of sampling errors. These weights were based primarily on the sampling ratio for schools, but were modified to allow for sampled schools which were unable to participate. These modifications resulted in variable weights. The weights do not take into account the non-respondents and as a result, the weighted frequencies are underestimates of the population. However, the percentages and correlation coefficients are believed not to be greatly biased by this procedure.

MAJOR FINDINGS

I. Educational Development

A. Guidance Programs

1. In 1960, 73% of the public senior high schools reported that they "...have a guidance program in which one or more persons is officially assigned..." to work with individual students; 52% had a program in 1958 or earlier; and 36% had a program in 1955 or earlier. These figures varied with the size of the senior class; the larger schools having had programs for a greater length of time.

2. Projections for schools having guidance programs in 1962 and 1964, based on schools' reported plans for instituting a guidance program provided estimates of 83% for 1962 and 89% for 1964.

3. Since 1958, gains have been made in facilities and services offered by the guidance programs; 60% of the schools with guidance programs reported an increase in counselor personnel or services.

4. The schools' reports on guidance resources show that 42% reported a less than adequate budget, and 68% less than adequate clerical assistance.

5. The guidance services most frequently mentioned as being performed regularly were as follows: administering the testing program; helping students plan their high school programs; pre-college counseling (on an individual rather than group basis); and counseling with individual students achieving below the acceptable scholastic level. The guidance services that appear to need strengthening (i.e., that were infrequently mentioned as being performed regularly) were placement, counseling follow-up, research, and utilization of group methods.

6. Resources for communicating information to students were investigated including printed matter on colleges, occupations and the military services; and the number of different means used to present information to students on college scholarships, occupations, and the military services. In general, the public high schools that are located in urban areas; that have larger than average senior class enrollments; that include the junior-senior high school or senior high school only grade structure are the ones that have had a guidance program for some time; and have more than the average number of full-time counselors reporting having "...complete, up-to-date, and well-organized..." printed materials and use a greater than average number of ways to communicate information to students.

B. Counselors

1. There are more men assigned to counseling duties in the American high schools than women. Of the approximate 17,000 counselors that spend 20% or more time in counseling, about 61% are male. When the number of counselors is defined as persons spending 50% or more time in guidance duties, the approximate numbers are reduced to between 10,000 and 11,000, and the ratio of male to female counselors changes considerably. Women make up 43% of the part-time counselors, as compared to only 39% of all counselors. In the smaller schools (fewer than 100 seniors) 77% of the counselors spending 50% or more of their time in counseling are male. The larger schools (100 or more seniors) have a ratio of one female counselor for every male counselor.

2. The median age for counselors is slightly over 40. The small school counselors tend to be younger than the median age. There is a relationship between age and time spent in counseling, with the older persons spending more time in counseling.

3. Approximately 70% of the counselors have a minimum of a master's degree. Sixty-four per cent of these counselors are men. Those counselors over forty years of age make up 55% of the guidance workers with a master's degree. Those schools with less than 100 seniors have the largest proportion of counselors who do not have a minimum of a master's degree. More than one in three of counselors in these schools do not have a master's degree.

It must, however, be pointed out that this does not mean that those persons with at least a master's degree are fully qualified counselors, for there is evidence that degrees have been obtained in fields other than counseling and guidance. A more precise and valid indicator of counselor quality would be the amount of course work in the area of guidance.

4. Guidance workers appear inadequately trained when a review of their course work is made. However, 79% of the counselors have had some courses in introduction to counseling; 70% have had philosophy and principals of guidance; 66% have had organization and administration; and 57% have had a course in educational and occupational information.

Course areas where over 50% of the counselors have had some training, but where four graduate credit hours would not appear to be sufficient, are: analysis of the individual, 54% have had less than four hours of graduate course work; 77% have had less than four hours of methods of research; 58% have had less than four hours of psychological foundations; 90% have had little or no sociological foundations; 70% have had no counseling practicum and about 17% have had less than four hours and 69% have had no training in group work at the graduate level. For such subjects as placement, follow-up and evaluation, and economic foundations a large majority of guidance workers have had no courses at all. This might be accounted for by the fact that many guidance curricula do not have separate courses in placement, follow-up, and evaluation; and many programs do not require economic foundations. Therefore, this could explain the large number who have not had such courses.

When the counselor group is pared down by including only those spending 50% or more of their time in counseling and guidance duties, the ratios do not change significantly. In comparing counselors of small schools (who are spending 50% of their time with guidance responsibilities) with their counterparts in larger schools, it appears that counselors from smaller schools are more adequately trained, as indicated by course work. The reverse of this is true when all counselors are compared.

5. The Counselors were asked if they had received any counseling and guidance training in college. Only 18% said they had not received any training in college. In considering only those counselors who spend 50% of their time with guidance duties, the per cent drops to 10 who have not received any training in college.

6. Approximately 8,000 school counselors are certified or licensed by their state. This means that 42% are certified or licensed. When a breakdown by school size for the whole group is made, 50% of the counselors of large schools are certified as compared to 31% for small schools. If only those counselors who spend 50% of their time in guidance are considered, there is no difference. Both small and large schools, then, indicate that 43% of their counselors are certified. The analysis of the findings pertaining to training and course work makes it apparent that certification requirements are minimal.

7. Approximately 82% of all counselors have had at least five years of teaching experience. Of the counselors with five or more years of teaching experience 55% come from schools with senior classes of 100 or more. Less than 1% of all counselors have less than a year of teaching experience. Apparently the only major source of counselors and guidance workers is from the field of teaching.

Of all the counselors 48% have had 5 or more years of counseling experience. Approximately 83% of the counselors in the smaller schools had a minimum of 1 or 2 years of counseling experience. Schools with senior classes of more than 100 students had 86% of their counselors with a minimum of 1 or 2 years of counseling experience.

Fifty-eight per cent of all the women in counseling have had more than five years of counseling experience. There are at present fewer women in counseling than men; yet there are more women than men with at least a minimum of 10 years of counseling experience. This would indicate that there were more women than men in the counseling field in the early years, but within the last 10 years there has been a definite trend for counseling to become more and more a man's profession, as indicated by more men than women in the profession. Also the ratio of men to women at the lower levels of experience is approximately 2 to 1 favoring the men.

8. Counselors feel their greatest contribution is to help students make effective use of their abilities.

The counselors were asked to choose from among items the three most important contributions that might be made to the lives of their students. These items were stated to show the value orientations of the counselor. The findings are:

a. "Help students make effective use of their abilities" was ranked by 81% of the counselors. Guidance workers felt this was their most important contribution to students.

b. Seventy-two per cent felt "aiding students in increasing their understanding" was an important contribution that the counselor could make. There was a trend for counselors to rate this contribution higher, the more time they spent in counseling.

c. Thirty-three per cent did not rank "to help students make educational and vocational plans" as one of three most important contributions counselors can make to students. Those counselors who spent more time in guidance considered this contribution as less important.

d. "To help students develop a sense of values" was ranked important by only 45% of the counselors. Full-time counselors tended to rate this more important than part-time counselors.

e. Forty per cent of the counselors indicated that helping students adjust to school life and its requirements is a major function of guidance. Those who spend less time counseling think this contribution is less important. Counselors in small schools tend to feel this is more important than counselors in large schools.

f. "Help students solve personal problems" was not ranked by 76% of the counselors. Counselors spending less time in counseling tended to rank this contribution as important. The same seemed to be true for counselors from small schools.

g. Seventy-seven per cent of the counselors indicated that helping students in getting along with others was not one of the major functions of a guidance worker. The more time a counselor spent in guidance duties, the less important he considered this contribution.

C. School mean test performance and School Practices as related to school mean criterion performance and achievement.

1. The following factors correlated highest with school achievement:

a. Male teacher starting salary
b. Housing quality
c. Absentee rate
d. Per-pupil expenditure
e. College attendance rate

2. The following factors correlated below .20 with school achievement:

a. Size of senior class
b. Dropout rate
c. Average class size
d. Rural-urban status

3. School mean achievement test scores correlate very highly. For example:

a. English Total vs. Reading Comprehension - r = .917
b. English Total vs. Mathematics Total - r = .884
c. Mathematics Total vs. Reading Comprehension - r = .881

D. Guidance Programs and Communities

1. In the large cities and North-east region at least 90% of the schools had guidance programs. In the West and Southeast regions the percentages ranged from 48% to 95% of the schools having guidance programs. Within these regions fewer rural and small-town schools compared with urban schools had guidance programs. The South, West, and rural and small-town schools had organized their guidance programs more recently than had the large city schools and the Northeastern region.

2. The guidance resources such as clerical assistance and the guidance budget are associated with the location of the schools. For example, large proportions of the large city schools indicated that the budget for guidance was less than adequate.

3. The students in the schools that have a guidance program tend to have higher than average test scores.

E. The school's use of tests, trends in the use of tests, types of tests used, reporting test results to parents, and the purposes for which tests are used were found to be as follows:

Preliminary unweighted data were shown by taxonomy group in order to explore the response distributions and to examine variation by region, city size, rural versus urban status, and socio-economic level of the community (housing quality). (Inasmuch as the data are unweighted, they should be generalized to the national population with caution.)

1. The percentage of schools using standardized tests was very high. The areas in which less than 95% of the schools were using standardized tests were the Southeastern rural schools, 90%; Southeastern urban low-quality housing schools, 92%; and Western low-quality housing urban schools, 92%.

2. Large proportions of the schools indicated that they had increased their participation in testing programs in recent years and also planned to increase their use of standardized tests. In addition, almost all the schools thought that they were making more effective use of tests than they were two years earlier (1958). These data appear to show little visible reaction against the use of standardized tests.

3. The particular types of tests used and whether the tests were administered to all students, to groups, or to individual students, showed considerable variation according to taxonomy group. It was frequently noted that vocational schools and Southeastern schools were lower than the average for particular tests. For example, the vocational schools infrequently used multiple aptitude batteries, interest inventories, or personality inventories. The particular type of standardized achievement tests used did not appear to be consistently related to region, socio-economic factors, city size, or rural-urban location. On the other hand, the percentage of the schools administering scholarship tests was shown to be related to the percentage of boys going to college.

4. Large proportions of the schools report test results to parents, either as interpretive reports only, or in terms of test scores and interpretive reports. Reporting test scores and providing an interpretive report was shown to be positively related to the average reading comprehension score of the students in the schools and negatively related to the quality of the housing served by the school.

These findings were interpreted as follows: the higher the reading level, the more likely the school is to report test scores to parents; the larger the proportion of low-quality housing in the neighborhood of the school, the lower the proportion reporting test results to parents.

5. The schools reported that tests were used most frequently to aid in placing students in the various curricula; as a measure of achievement; to measure the student's growth; to measure the school's growth; to help the student gain a better understanding of himself; as an aid in counseling; and for various academic and college purposes. The vocational schools appeared to be exceptions on many of these items, standing low relative to the other groups of schools.

## F. Relationships of School and Community Characteristics to Aptitude and Achievement Tests

1. Student achievement in most subjects is predictable to a high degree from ability plus amount of exposure to experiences related to the subject matter areas. For English achievement the most important factors are:

   a. Being in an academic curriculum rather than in a vocational high school
   b. Having well-paid and experienced teachers
   c. Having an adequate library in the school
   d. Having considerable homework
   e. Having study halls

Somewhat the same conclusions can be made about other subject matter areas except that in cases of areas other than English, the size of the library is not as important.

2. The Project Talent data indicated that four of the most important treatment factors closely and uniquely associated with school outcomes such as achievement, going to college and staying in school are:

   a. Teacher salaries
   b. Amount of teachers' experience
   c. Number of books in the school library
   d. Per-pupil expenditure

3. The data on Project Talent indicated that the following characteristics seem unlikely to be important causes of excellence of school output:

   a. School size
   b. Average size of classes
   c. Age of building
   d. Suburban location

4. Educational achievement in various subject matter areas seem very closely associated with the amount of work taken or assigned in such areas and with various types of aptitude for learning such work. However, achievement in these areas has a very low relationship to most school characteristics even with many such as school size and average class size that have long been thought to be very critical as factors in the achievement of school excellence.

G. Relation of School Practices and Characteristics to Educational Outcomes

1. Abstract Reasoning test means for groups of low cost housing schools are considerably lower than for better quality housing schools in the same cities or areas. An exception to this is the group of four low cost housing schools for small cities in the Northeast. These schools score lower than the analogous Northeastern better quality housing schools but compare favorably with the other groups of better quality housing schools.

2. Quality of housing has little relation to per-pupil expenditure. It has a low relationship with size of senior class for the entire group. However, the schools in very large cities in areas with better quality housing have nearly twice as large senior classes, on the average, as the schools in low cost housing areas in the same cities. Most of the extremely large high schools in the country are from higher quality housing areas.

3. School mean scholastic achievement shows a moderate degree of relationship with per-pupil expenditure, but some low expenditure-better quality housing groups have high achievement and other high expenditure-low cost housing groups have low achievement. High expenditure rates do not seem to be a necessary prerequisite for obtaining high achievement. Other factors can compensate for lower expenditure rates in some cases.

4. Rural and small town taxonomy groups for each of the three areas tend to cluster closely with each other within the area on all the charts.

5. In intermediate size cities there is a much higher delinquency rate for the low cost housing schools, while both the low and higher cost housing schools in the very large cities have low delinquency rates. However, the vocational schools, which are numerous in the largest cities but not in intermediate size ones, have a high delinquency rate. The behavior cases are perhaps diverted from low cost housing comprehensive high schools to the vocational schools in some way.

6. There is a high negative relationship between proportion of students in a general curriculum and Reading Comprehension test mean score.

7. With aptitude level held constant, urban-better quality housing school groups tend to do better than predicted for per cent of boys entering college except in the Northeast. The Northeast area school groups as a whole tend to have a lower college entry rate than for comparable schools in other parts of the country.

8. There is a very high relationship between achievement in English and achievement in mathematics.

9. All of the urban-better quality housing area groups tend to be significantly lower in Mechanical Information than in English. It is hypothesized that the environment of the middle-class urban youth is such as to slow his rate of acquisition of mechanical information in comparison with other kinds of information or subject matter. As would be expected, the vocational schools do especially well on the Mechanical Information Test.

10. The vocational high schools are near average in mean Abstract Reasoning Test score but are the poorest group of all in English. They also tend to be lower on the Reading Comprehension Test than on Abstract Reasoning.

11. The test score patterns of many of the vocational high schools, where less than 10% of their boys go on to college, indicate that perhaps as many as one-fourth of their students have academic aptitudes equivalent to those of students in many other schools in many parts of the country who enter college, and even graduate from college.

AUTHOR(S): John C. Flanagan, et al.

TITLE: Project Talent: The American High-School Student

PUBLISHER: University of Pittsburgh . . . 1964

MAJOR ISSUES:

The waste of individual talent and the failures and frustrations of young people should be documented so that the nature of an effective educational program can be defined.

Also, the talents of the students and the educational programs of the high schools should be examined in the light of occupational opportunities and trends.

Project Talent involves the study of American youth including an inventory of their abilities in the light of personal and social needs and in terms of the social context in which they live (p. 1-2)

OBJECTIVES OF THE STUDY:

General Objectives:

1. To survey available talent: to undertake an inventory or census of the potential manpower pool that would provide a sound basis for planning national policies and meeting the country's needs in key professional fields such as science, medicine, and engineering, and in important nonprofessional fields.
2. To identify interests, aptitudes, and background factors: to investigate the interrelationships of patterns of aptitudes, preferences, interests, socioeconomic status, and the motivational factors prevailing in our secondary-school population.
3. To determine effects of lack of interest and motivation: to study the extent to which lack of interest on the part of some of our talented young people tends to deter them from undertaking the further training that might qualify them for careers in highly specialized fields.
4. To identify factors affecting vocational choice: to investigate the dynamics of personal decisions and environmental factors that ultimately determine the individual's choice of an occupation or career.
5. To identify predictors of creativity and productivity: to study the patterns of aptitude, interest, and motivation that underlie creativity and productivity in several different fields.

6. To determine the effectiveness of various types of educational experience: to study the effectiveness of various types of educational experience in producing learning and in developing special talent.

7. To study procedures for realizing individual potential: to investigate procedures for assisting each individual to make full use of his potential abilities.

DESCRIPTION OF SAMPLE:

The findings of this report are based on analyses of two sub-samples of the Project Talent sample:

1. One-tenth of the senior high schools in the Talent sample, together with their associated junior high schools. This sub-sample was selected in such a way that its schools would be representative of the group of schools constituting the total Project Talent sample.

2. A representative ten percent of all students in Project Talent. This is an "across-the-board" sub-sample, consisting of ten percent of the students from all grades in all Project Talent schools.

INSTRUMENTS AND MEASUREMENTS:

See Shaycoft abstract for a comprehensive description of the Project Talent test battery.

VARIABLES STUDIED:

See Shaycoft abstract

MAJOR FINDINGS:

I. Educational Development

   A. Educational plans and aspirations

      1. About 53 percent of the high-school senior boys and 46 percent of the girls expected to enter college immediately after graduation; about 73 percent of the boys and 58 percent of the girls planned to attend college at some time; but only 53 percent of the boys and 33 percent of the girls expected to graduate from a four-year college. Actually, follow-up data show that 49 percent of the senior boys and 35 percent of the senior girls did attend college within a year following testing.

2. More boys expected to enter engineering than any other field. By far the largest percentage of girls expected to become secretaries, office clerks, or typists. There is some evidence that high-school seniors are unrealistic in their career plans. About 48 percent of the boys and 40 percent of the girls planned to enter a professional or technical field; yet Census data show that only about 15 percent of employed males and 17 percent of employed females between the ages of 25 and 29 are in professional and technical occupations.

B. Student background and aspirations in relation to aptitude level

1. High-aptitude students contrasted with low-aptitude students, grouped in ten categories of level of academic aptitude, tend to have started school earlier, to have enrolled in college-preparatory courses (such as mathematics and foreign languages) to a greater extent, to have spent more hours per week in studying, to be members of the more prosperous and better educated families, and to have aspirations for obtaining more education.

2. Many students in the lower half of the aptitude distribution expected to attend college and obtain at least a bachelor's degree. In fact, 16 percent of the boys and 12 percent of the girls in the lowest one-tenth of the aptitude distribution had this expectation. About 26 percent of the students in this category reported that their parents wanted them to obtain college degrees. In general, it appears that the educational aspirations of twelfth grade pupils may be more realistic than their parents' expectations for them in this respect.

3. The amount of education the twelfth-grade student expected to obtain was most closely related to his scores on the Culture, Leadership and Mature Personality Scales.

4. The personality scales showed little relationship to the amount of education the students' friends expected to obtain.

5. There was a tendency for students who felt that a college degree is necessary for the kind of work they want to do to have higher-than-average scores on the Culture, Leadership, and Mature Personality Scales.

   Boys with high scores on the Culture Scale tended to be those who reported that their teachers advised college attendance for them.

## II. Personal Development

### A. Environment - Family

1. The occupations of their fathers and mothers, as reported by the twelfth-grade pupils, tend to fall into higher level categories more often than would be expected on the basis of Census data. The mothers of about 28 percent of the students have engaged in regular full-time work and an additional 13 percent have mothers who have done regular part-time work; the mothers of 24 percent have done part-time work either regularly or occasionally.

2. About three-fourths of the students reported living in one-family houses owned (or being purchased) by the family. They estimated the value of the median house as $13,500. Among those living in rented houses or apartments, the median rental was estimated as $65 per month. A description of some of the family possessions and of the equipment in the home has been provided. The median family income in 1959 was estimated to be about $7,000.

3. The highest levels of parents' education correlated only slightly with scores on the Personality scales; were higher among girls than boys.

4. Size of home and number of persons in it did not seem to be closely related to any of the personality scales or to self-reported grades. Students' reports of the total family income had only small positive correlations with the personality scales and with self-reported grades.

### B. Personal characteristics (derived from ten personality scales in the Student Activities Inventory [SAI]).

1. High-school girls are better behaved, better mannered, more sensitive, and more sociable than high-school boys. Girls take their school assignments more seriously than boys.

2. Among boys, four of the SAI scales (Social Sensitivity, Calmness, Self-confidence, and Mature Personality) tended to have higher correlations with the achievement and aptitude scores than did other scales.

3. Among girls, most of the significant correlations between scores on the personality scales and the cognitive tests pertained to scores derived from the Mature Personality scale the Culture scale, and the Social Sensitivity Scale.

6. The relationships of the SAI scales to variables associated with reading problems, effort, work habits, and interest and attention suggest that the Mature Personality and Self-confidence Scales are those most closely related to these variables. Mature Personality seems to be slightly more highly correlated with these variables among girls than among boys. In general, however, the patterns of relationships seem to be essentially the same for girls as they are for boys.

7. The relationship between scores on the Vigor Scales and boys' state of health was larger (.28) than those between scores on the other personality scales and state of health.

8. For boys, participation in high-school athletics had a higher significant positive relationship with scores on the Leadership scale.

   For girls, the Vigor Scale showed a highly significant correlation with participation in athletics and sports.

ADDITIONAL FINDINGS:

1. Twenty to 30 percent of students in grade 9 know more about many subject-matter fields than does the average student in grade 12. Variability within grades is greater than variability between grades.

2. The top 5 percent of students in a grade can learn the English meanings of at least twice as many foreign words as the average student in the same period of time.

3. Sectional differences in achievement are noticeable. Students in the Northeast tend to be above the national average and students in the Southeast below that average. However, differences within each section are much more striking.

4. Less than half of twelfth-grade students understand the subtler ideas in typical paragraphs from the writings of Sinclair Lewis, Jules Verne, or Rudyard Kipling. Much smaller percentages understand the writings of Thomas Mann or typical articles in the Atlantic Monthly and the Saturday Review.

5. The average high-school student apparently doesn't solve simple reasoning problems as well as he memorizes simple rules (like the rules of capitalization) and applies them.

6. Differences in the relative levels of information that an individual displays often reflect his pattern of interests more than his pattern of abilities.

7. Amount of formal training in an area or informal exposure to it, even if that training or exposure has not been sought by an individual, plays some part in determining the amount of information he acquires in the area.

8. Most sex differences that have been found in patterns of information reflect differences in interests. (It is recognized, of course, that there is probably considerable linkage among intrinsic ability in an area, exposure to it, and interest in it.)

9. The fact that differences in ability within grades are so great in comparison with differences between grades is a strong argument in favor of the individualization of instruction to the full extent that facilities and staff time can be made available for it.

10. Student Characteristics: Students take part in a wide variety of interest groups. The most common affiliations are with groups sponsored by religious or charitable organizations. Swimming is the most popular sport with boys and girls. Boys and girls differ greatly with respect to their participation in other sports and hobbies.

11. Educational Experiences; Most of the students began school at the age of six and continued without interruption (other than minor illnesses) through the grades. About 48 percent of the boys and 38 percent of the girls enrolled in a college-preparatory program in high school. Commercial programs enrolled 7 percent of the boys and 37 percent of the girls, while 25 percent of the boys and 19 percent of the girls enrolled in a general program.

12. The interrelationships among boys and among girls of the 26 Information-Test subscores, the 17 interest scales, the 10 personality scales, and the 44 activity items suggest the presence of 10 or 11 clusters of variables, as follows:

    a. Academic Achievement

    b. Mechanical and Technical Activities, Interests, and Experience

    c. Sports Activities and Interests

    d. Cultural Activities

    e. Household, Farming, and Gardening

    f. Outdoor Recreation and Activities

    g. Leadership

    h. Scientific and Mathematical Interests

    i. Reading

    j. Sociability

    k. Business Management and Office Work

The patterns of scores of boys and of girls on information and interest tests are very similar. These and other data suggest the need for further research on the use of information scores to measure interests.

13. Only about 21 percent of the boys and 29 percent of the girls did not hold at least one full-time job in the year after they left grade 12. About 44 percent of them found their first full-time job before they left high school and another 12 percent found it in a week after leaving school. About 7 percent of them took more than 6 months to find it. More girls than boys (some 60 percent) were very well satisfied with the job they held as of May 1961, but fewer girls than boys intended to make a career of this job. The most important aspect of a job or career for both boys and girls was reported as personal interest in the work, followed by job security, and (especially for the boys) future salary and opportunity for promotion.

14. Of boys who had entered college and dropped out or who were still attending college, 12 percent held jobs as unskilled laborers. About 12 percent held clerical or stock-checking jobs of various types. Another 10 percent were salesmen, principally sales clerks. About 9 percent worked as skilled laborers, such as carpenters and metal workers.

15. The dropout rate among college freshmen varies greatly from one institution to another. In the Project TALENT sample, about 21 percent of the boys and 24 percent of the girls dropped out during or at the end of the freshman year.

16. Several other factors were positively related to entrance to college. One of the most important of these was geographic region. Among respondents to the 1961 mail questionnaire, the rate of entrance to college was highest in the Far West and Southwest and lowest in New England and the Middle East. However, data based on all school children and on the entire Project TALENT sample lead to the conclusion that the secondary schools of the Southeast and the Southwest lacked holding power in comparison with those in other parts of the United States and that opportunities for attending college were much greater in the Far West than in some other sections of the country.

AUTHOR: Marion F. Shaycoft

TITLE: Project Talent, The High School Years: Growth in Cognitive Skills

PUBLISHER: American Institutes for Research and School of Education, University of Pittsburgh, 1967

MAJOR ISSUES:

In studying human talents the dimension of growth is important. Most studies of the organization of mental abilities have been limited to a single set of measurements taken at one point in time. The data collected in March of 1960 by the Project TALENT staff represented one large effort to obtain rather extensive data on a representative sample of American high school students.

In 1963 it was proposed that in order to gain some depth in this survey, and to obtain a better understanding of the nature of the growth of these variables and their interrelations over time, a sample should be retested. This was done in an attempt to approach a fundamental understanding of measurement and prediction procedures which might assist young people in the identification, development, and utilization of their talents to the fullest extent possible.

OBJECTIVES OF THE STUDY:

General Objectives:

1. To determine the nature and magnitude of growth and change in the cognitive domain that occurs in students between grades nine and twelve, and to go beyond descriptions of such changes by analyzing the factors that promote or inhibit certain changes.

2. To find out indirectly if some schools are more effective in promoting change than others.

3. To present some findings about the Project TALENT tests themselves that might be applicable to future research on that data.

Specific Objectives:

1. To determine the relative extent to which achievement as of grade twelve is a direct outcome of the student's potential when entering high school, and the extent to which it represents departures from what would have been predicted on the basis of the student's grade nine record.

2. To estimate the proportion of a student's ability pattern which is subject to modification during the high school years.
3. To compare the factorial composition of two sets of data obtained three years apart and determine whether the number and nature of the common factors changed in those three years.
4. To determine whether socioeconomic factors play a major role in any shifts in the student's ability pattern that occur in the high school years.
5. To determine if students who plan to go to college learn more in high school than students who do not have college plans
6. To determine the role played by choice of courses in determining grade twelve achievement level in various areas.
7. To determine if counseling received is a determinant in grade twelve achievement levels.

## MAJOR HYPOTHESES:

No a priori hypotheses were formulated. The study, being descriptive in nature, did not lend itself to the formulation of hypotheses.

## DESIGN OF STUDY:

Longitudinal: three year period (1960-1963) with test-retest of several subsamples of the original sample group.

| Grade When Tested in 1960 | Years for Follow-up Studies | | | |
|---|---|---|---|---|
| | 1-Year Follow-up | 5-Year Follow-up | 10-Year Follow-up | 20-Year Follow-up |
| 12 | 1961 | 1965 | 1970 | 1980 |
| 11 | 1962 | 1966 | 1971 | 1981 |
| 10 | 1963 | 1967 | 1972 | 1982 |
| 9 | 1964 | 1968 | 1973 | 1983 |

## DESCRIPTION OF SAMPLE:

1. Population: The students were enrolled at 101 non-vocational and 17 vocational high schools, all of which were public. The schools were chosen to be

representative of all public secondary schools, except that schools in the five largest cities were excluded.

2. Sampling procedure:
    - a. The goal was to have a retest sample which included a wide variety of the schools from the original sample.
    - b. The secondary school taxonomy developed by John T. Dailey (1962) was used in selecting schools.
        1. Public non-vocational high schools are divided into 16 categories according to size; city of location; type of city/town of location; region; and socio-economic level of the community served.
        2. Vocational and trade schools form a 17th category.
        3. Schools from each category except two participated. The two not included were non-vocational schools located in cities of over a million and a half. They were excluded for administrative reasons.
        4. Private and parochial schools were not included.
        5. Procedures for the selection of the schools within each of the 15 categories were not described.
3. Size of sample:
    - a. Number of schools: 118, 101 were non-vocational; 17 vocational
    - b. Number of students tested: 10,396
    - c. Number of students tested in 1963 for whom 1960 data was available: 7,678.
4. Sex: equal representation, with 5230 males and 5166 females.

INSTRUMENTS AND MEASUREMENT:

The instruments used in the 1963 testing were identical with those in the original 1960 battery, with the exception that the Student Information Blank was revised, and three of the original instruments were omitted (Student Activities Inventory, Memory for Sentences Test, and Preferences Test). The major tests which were retained were organized into six Batteries, labled A,B,C,D,E, and F.

1. Each Battery partially overlapped and contained approximately half of the original tests. The overlapping was so arranged that each pair of tests was taken by at least one-sixth of the boys and one-sixth of the girls.

a. Each participating school was given one of the six Batteries.

b. In the cases of 10 vocational high schools, a seventh Battery designated V was used.

2. Composition of the Batteries included selection of the following tests which had been designed for the 1960 Study:

a. Information I and II designed to measure students' level of information in a variety of fields ranging from literature and music to Bible and fishing.

b. Memory for Words, Disguised Words, Abstract Reasoning, designed to measure general mental ability.

c. Creativity, Mechanical Reasoning, Visualizing in Two and Three Dimensions, designed to measure level of specialized aptitudes.

d. English Test and Word Functions in Sentences designed to measure level of skills and knowledge in English.

e. Arithmetic Computation, Math I, II, and III, Table Reading, Clerical Checking and Object Inspection designed to measure level of mathematical skill and knowledge.

f. Reading comprehension, desgined to test reading ability.

g. Revised Student Information Blank designed to obtain information about students' courses taken, occupational plans and assistance received from counseling and testing.

To provide a basis for checking on the comparability of the groups taking the various Batteries, and for adjusting statistically to make them more comparable, one test, Abstract Reasoning, was included in all Batteries.

VARIABLES STUDIED:

1. Ninety-nine variables were selected for inclusion in the matrices: forty-nine aptitude and achievement test scores for grade nine, the same for grade twelve, and a socio-economic index.

2. Other mediating variables which were felt might be having a substantial, though indirect, effect on the extent to which the student's mastery of specific areas changed during the high school years, included the students socio-economic status; plans; and the extent to which the school had helped or had formally tried to help the student in making his plans.

3. The variables included:

    a. Level of information in grade 9 and in grade 12 (e.g., amount of information in 26 different areas ranging from literature and music to the Bible and hunting.)

    b. General mental ability in grade 9 and in grade 12 (e.g., abstract reasoning, mechanical reasoning, memory for words, disguised words, Vocabulary I, and scientific aptitude.)

    c. Level of specialized aptitudes in grade 9 and in grade 12 (e.g., creativity, mechanical reasoning, visualization in two and in three dimensions)

    d. Level of English skills and knowledge in grade 9 and in grade 12
    (e.g., spelling,capitalization, punctuation, English usage, effective expression)

    e. Level of mathematical skills and knowledge in grade 9 and in grade 12
    (e.g., Arithmetic reasoning, Intermediate High School Math, Advanced High School math, table reading, clerical checking, object inspection)

    f. Level of Reading Comprehension in grade 9 and in grade 12

    g. Socio-economic index
    (e.g., students' estimate of value of family home, Father's income and occupation, parents' education, number of books in the home, kinds of appliances in the home, whether student has own room, desk and typewriter)

    h. Student information
    (e.g., number of courses taken in math, physical science, science and foreign language, student theme on "My Views about an Ideal Occupation" and student theme on help received from testing and counseling.)

i. High School Data
(e.g. vocational-trade school or non-vocational school, size of community, socio-economic level, regional location, characterization of residences in the area served by the school)

STATISTICAL PROCEDURES:

1. Canonical correlation between grade nine and grade twelve scores
2. Factor analysis to determine pattern consistency from grade nine to grade twelve
3. Univariate analysis of variance among schools
4. Multivariate analysis of variance among schools
5. Multiple discriminant function analysis
6. Partial and part correlation matrices
7. Partial canonical correlation analysis
8. Stepwise multiple regression analysis
9. Split-half procedure based on Angoff formula 16 for reliability

About the Project TALENT battery:

1. Empirical data confirmed that most of the tests were speeded (or unspeeded) to just about the degree that was specified in the original test rationale.
2. The study was found to not be affected to any important degree by clerical inaccuracy on the part of those tested.
3. Reliability
   a. Of the tests: The tests on the whole have very satisfactory reliability coefficients in relation to test length.
   b. Of Difference Scores: Reliability coefficients for differences between correlated scores tend to be low. But some of the TALENT tests turned out to have surprisingly high reliabilities for the difference between grade nine and grade twelve scores.
   c. Of Residual Scores: Residual grade twelve scores (after elimination of the component predictable from the corresponding grade nine scores) have satisfactory reliability. They are generally more reliable than difference scores.

## MAJOR FINDINGS

### I. Cognitive Intellectual Development

A. Patterns of Mental Growth

1. There are somewhat different patterns of mental growth between the sexes.
    a. Boys acquired significantly more information than girls in many areas, including mathematics, physical science, aeronautics and space, electricity and electronics, mechanics, and sports. They also made significantly larger score gains than girls on several aptitude tests, including Creativity, Mechanical Reasoning, Visualization in Three Dimensions, and Abstract Reasoning.
    b. Girls showed significantly larger gains than boys in Literature Information, Memory for Words, Spelling, and Home Economics Information.
    c. For boys the largest gains were in math, literature, accounting, business, sales, law, and on the Creativity Test.
    d. Girls showed their largest gains in the same fields, with the exception of Math Information, which dropped considerably.
    e. For both sexes, the gain in Abstract Reasoning was almost half a standard deviation.
    f. For almost all the variables, the sex showing the larger average gain between grades nine and twelve was also the sex with the higher mean score in grade nine.
2. Of all the common factors, the verbal factor was the closest to a general factor which was commonly called "general verbal intelligence," "scholastic aptitude," or "academic aptitude." It was the only one of the factors that had a high correlation with socio-economic index. Other important common factors were found to be mathematical ability, spatial, English, and technical information.
3. Two variables, Abstract Reasoning and Vocabulary I together, were found to account for much of the general ability factor entering into the various grade twelve scores.

4. Only about twenty percent of the Reading Comprehension variance and twenty percent of Abstract Reasoning variance are typically subject to modification during the high school years, and even smaller percentages of Arithmetic Reasoning variance and Vocabulary I variance.

5. The general factor accounted for a larger proportion of the grade nine variance than of the grade twelve variance, providing some support for the theory that special abilities become differentiated out of the single general mental ability factor as a child grows older.

6. Two factors with substantial loadings on certain grade twelve variables and zero or near-zero loadings on grade nine variables were found; one in English and one in information. These were "change factors" representing growth or other change in relative status between grades nine and twelve.

7. Twenty-three of the forty common factors for each sex were "test-specific factors," having loadings on only two variables; the grade nine and grade twelve scores for a single test.

8. In just about every case, grade nine ability in a particular area made a "very substantial" contribution to grade twelve ability in the same area.

9. Foreign language courses taken have no effect on English test performance, nor does it affect performance on the Memory for Words Test.

10. Planning to go to college "does not appear to have any spectacular effect on twelfth-grade scores," aside from its motivational factor in a student's choice of courses.

11. The amount of counseling a student receives in high school appears to have little effect on test score gains after initial ability and socioeconomic status have been taken into account.

12. Differences within a grade were found to be greater than the differences between grades.

## II. Educational Development

### A. Mental Growth

1. Growth in mastery occurred in all areas, but the larger gains generally tended to be associated with school-taught subjects.

2. Students in some schools learned more, or improved their ability, more than students in other schools. However, there is no way of distinguishing clearly and definitely between effects of what the school does and the effects of other environmental influences.

CONCLUSIONS:

1. Sharp distinctions should no longer be made between "aptitude" and "achievement" categories of measurement. The choice of such terms should be based on how and for what purpose the test is being used.

2. The following nine tests provided a sufficiently stable picture between grades nine and twelve that they may be regarded as aptitude measures:

   Abstract Reasoning
   Arithmetic Reasoning
   Memory for Words
   Disguised Words
   Vocabulary I
   Scientific Attitude
   Creativity
   Mechanical Reasoning
   Visualization in Two Dimensions

   The first six of these are probably primarily measures of "general verbal ability" or "general mental ability." The remaining three aptitude tests probably should be regarded primarily as measures of specialized aptitudes.

3. Socio-economic concerns

   a. The cause-and-effect relationships explaining the correlation between the verbal and socio-economic index are undoubtedly complex and almost certainly operate reciprocally.

   b. The primary way in which socio-economic factors operate in affecting test scores (at least during high school), is by affecting certain behaviors, e.g., choice of an academic or a non-academic program in high school, choice of specific courses, planning for college, which, in turn, have a more direct effect on test scores.

   c. At least insofar as achievement of the types measured by the TALENT tests under consideration is concerned, whatever direct effects socioeconomic background has on achievement develop before grade nine.

4. Except in areas where formal instruction is received in different amounts by different students, the amount of information a student has been able to acquire and is sufficiently interested in acquiring and retaining is an excellent indicator of what his status in this respect will be three years later.

RECOMMENDATIONS:

1. Special efforts to help the disadvantaged child overcome the handicaps imposed by a deprived background should be concentrated on younger age levels. The implication of the present research findings is that postponement of remedial efforts until high school sharply curtails the success of such efforts.

2. Attention should be focused on research concerning the academic-versus-vocational-education issue, to find out whether the boy or girl taking a vocational program in high school will, as an indirect and unsought consequence, have less reading competence in adult life than he otherwise would.

3. Although the finding that schools do differ in effectiveness enhances the prospects of future improvements in education, one first has to identify the ways in which the more effective schools differ from the ineffective ones. Further research is necessarily complex and difficult, but must be undertaken to discover how schools can be improved.

AUTHOR(S): John C. Flanagan and associates

TITLE: Project Talent: Five Years After High School

PUBLISHER: American Institutes for Research and University of Pittsburgh, 1971

The following findings were reported in a series of separate research studies based on Project Talent five-year follow-up data. Although the findings were reported in separate chapters of the volume cited above, in this report they are presented together in order to facilitate the process of relating them to the four theoretical models.

MAJOR FINDINGS:

## I. Educational Development

A. Academic aptitude and socioeconomic status as related to college entrance and attendance.

1. The probability of entering college and graduating is directly related to students' socioeconomic status, academic ability, and high school curriculum; the lower a student's SES is, the less likely he is to go to college. This is true at all levels of aptitude.

2. Academic aptitude and socioeconomic status are significantly related to the type of educational institution and training a student enters into one year after graduation from high school (e.g., four-year college; two-year college; technical school; nursing school; secretarial school; trade school; armed forces school). These relationships are generally stronger for academic aptitude than for socioeconomic status.

3. Academic aptitude and socioeconomic status are significantly related to graduation from a four-year college within 5 years after high school graduation.

    a. High aptitude students have a greater probability of graduating from college than low aptitude students.

    b. Generally speaking, students of high status have a higher probability of graduating from college than students of low status.

    However, anomolies within the cells show that students from the lowest status--highest aptitude cell are about as likely to enter and graduate from college as are students from highest status--middle aptitude cells.

4. Those students who received less than a college education tend to come from the lower academic and socioeconomic status categories. Those who have gone to college tend to come from the higher ends of the scales. However, those students who failed to finish college are distributed approximately evenly over all four of the academic aptitude and socioeconomic status categories. A disproportionate number, relative to those who entered college, of low aptitude and low socioeconomic status students fail to finish college.

5. Regrets about not having gone to college are directly proportional to academic aptitude for males. The higher the aptitude, the greater the percentage of regrets.

6. Being married within 5 years after high school is inversely related to both academic aptitude and socioeconomic status with the relationship to the latter being the stronger of the two, and both relationships being stronger for males than for females.

B. Sex differences and college attendance

1. Girls are less likely to go to college than boys, but once enrolled they are more likely to graduate.

2. Women are less likely to work toward an advanced degree.

C. High school curriculum as related to college attendance and persistence

1. High school curriculum is an extremely important determiner of who goes to college at all levels of ability.

2. When subsamples of students are classified by their high school curriculum it was found that

   a. College preparatory students are under-represented in the subsample which didn't go to college. All other curricula students are over-represented.

   b. College preparatory students are under-represented in the sample of students who dropped out of college.

3. Students who followed a general, vocational, commercial, or business curricula in high school regret not having received additional education after high school more than do students who were in the college preparatory curriculum. (College Prep students who did not go to college do not regret not going to college any more than non-College Prep students.)

D. Counseling

1. Number of counselor contacts students had regarding college plans

   a. 52% of the males and 57% of the females reported they had never discussed college with a guidance counselor, or they attended a high school without a counselor.

   b. 48% of the males and 43% of the females had discussed college with a counselor one or more times.

2. Effectiveness of counseling regarding college plans

   a. College attendance is positively related to discussing plans with a counselor.

      (1) Of those who went to college, 62% of the males and 64% of the females had discussed college one or more times with a guidance counselor.

      (2) Of those who did not go to college, 32% of the males and 30% of the females had discussed college with a counselor one or more times.

      (3) Of those who started college but did not finish, 52% of the males and 57% of the females had discussed college one or more times with a guidance counselor. (Guidance counselors are not successful in discouraging students who are not college material from going to college.)

3. Of the males who indicated that they attended a school with no guidance counselor and had not gone to college, 17.3% were sorry they had not gone to college. However, overall discussing college with a guidance counselor was not found to be systematically related to satisfaction with college-related decisions, nor was discussing jobs found to be systematically related to satisfaction with job-related decisions.

4. Discussing jobs with a guidance counselor is not related to future educational decisions. Apparently students who discuss jobs with high school counselors are not being informed of the educational training some jobs require.

II. Vocational Development

A. Stability of career choice

1. There is little stability in career choice over the 5-year period starting in grades 11 and 12. Overall, only 13.4 of 11th graders and 18.6% of 12th graders still planned the career they had chosen in high school five years later. The percentage for girls would be substantially decreased if "housewife" were omitted.

B. Predictability of Project Talent tests to career choice

1. Results of computing correlations between membership in the 187 occupations and 109 test scores (64 cognitive tests and 45 non-cognitive tests) suggest that Project Talent tests have a moderate to high underlying relationship to most occupations.

   a. When expressed choices of career were used in predicting later occupations, correlation coefficients ranged from low to moderate.

   b. Predictions from expressed choice of career to occupation were not consistently superior to test predictions, nor vice versa.

2. A definition of 12 occupational groups was made and refined. These groups are as follows:

   a. Engineering, Physical Science, Mathematics and Architecture

   b. Medical and Biological Sciences

   c. Business Administration

   d. General Teaching and Social Service

   e. Humanities, Law, Social and Behavioral Science

   f. Fine Arts, Performing Arts

   g. Technical Jobs

   h. Business, Sales

   i. Mechanics, Industrial Trades

   j. Construction Trades

   k. Clerical Jobs

   l. General, Community Service, Public Service

3. By using all 109 cognitive and non-cognitive variables, a level of predictive efficiency in predicting whether a student will be in one of these occupational groups was about .60.

    a. There were marked similarities in the characteristics of students who, five years after graduation, were seeking careers in occupations within an occupational group.

    b. In general, the non-cognitive variables were at least as effective as the cognitive variables; for a number of occupations (physician, CPA, clergyman, lawyer, commercial artist) the non-cognitive variables were of more predictive value than the cognitive variables.

    c. There is some indication that test predictions are better for those occupations that gain relatively many members is the five years following high school graduation.

    d. Results of cognitive and non-cognitive tests show roughly equivalent validities for prediction of career choice with a small advantage for non-cognitive tests.

C. Counseling and occupational satisfaction

1. Discussing jobs with counselors was not found to be systematically related to satisfaction with job-related decisions.

2. Only about 1% of Project Talent participants say they are sorry about the kind of work they have chosen.

IMPLICATIONS:

1. Not all high school graduates can or should go to college. Therefore, guidance counselors need to be more realistic in their presentation of the demands a college will make upon its students.

2. Good opportunities exist for training for high school students who do not go to college, but guidance counselors must increase their efforts to make students aware of the opportunities.

3. Guidance counselors need to be aware of the relationship between academic aptitude, socioeconomic status, high school curriculum and the probability of a student's entering and graduating from college.

4. Hierarchical analysis of career groups does provide clues, insights, and a first approximation to a scheme for grouping career categories but no definite answers and no classification scheme that can be considered more than tentative.

RECOMMENDATIONS:

1. Instability in occupational choice suggests that the major function of high school guidance workers will continue to be helping students better understand both themselves and the various roles for which they might prepare themselves.

2. Students in American high schools can and should have available to them a sound basis for comparing their test scores (information, ability, interest and personality tests) with people who are planning careers in these occupations five years after graduating from high school.

3. Guidance counselors are not successful in discouraging students who are not college material (don't finish) from going to college.

**AUTHOR:** **Donald L. Thistlethwaite**

TITLE: Effects of College upon Student Aspirations

PUBLISHER: Office of Education (Washington, D.C.: Department of Health, Education, and Welfare, 1965).

MAJOR ISSUES:

During the period 1959-1963, there was a shortage of college teachers while at the same time the number of students enrolling in college each year was rapidly increasing. To the investigator, then, the major issue was how to provide more teachers to institutions of higher education. This issue, in turn, rested upon that of motivating undergraduates to seek graduate training in order to enlarge the pool of potential college teachers.

Thistlethwaite addresses himself to the problem of determining which factors in the college environment affect, positively or negatively, a student's disposition to continue his education after the baccalaureate. When such factors have been identified, it will be possible to recommend modifications of the collegiate environment which will strengthen students' motivation to enter a graduate or professional school.

OBJECTIVES OF THE STUDY:

General Objective:

To identify the variables influencing an undergraduate student's disposition to seek advanced training.

Specific Objectives:

1. To determine which of several pre-college variables predict a student's disposition to enter graduate school.
2. To isolate factors in various college environments which affect a student's disposition to enter graduate school.
3. To describe changes in students' educational aspirations during undergraduate school, by surveying students as they entered college (1959), after their sophomore year (1961) and before entering graduate school (1963).
4. To investigate which kinds of teachers are more influential in strengthening an undergraduate's desire to seek graduate training; which students are most affected by such teachers and what teacher behaviors are most involved in effecting such influences.
5. To recommend actions which colleges might take to motivate their students to pursue advanced degrees.

MAJOR HYPOTHESES:

I. Educational Development:

A. Certain, identifiable pre-college characteristics affect a student's disposition to seek advanced post-graduate training.

1. The following variables are significant predictors of post-graduate educational aspirations as well as of actual entry into advanced training.

    a. Sex

    b. Initial (pre-college) Educational Aspirations

    c. National Merit Scholarship Qualifying Test Scores (1958)

    d. Father's educational level

    e. Mother's educational level

    f. Number of freshman scholarship applications submitted

    g. Family financial resources (1959)

    h. Designated major field (five categories: Humanities, Physical Sciences, Biological Sciences-Psychology, Social Sciences, Miscellaneous fields)

2. (Implicit) The predictive value of these eight variables, singly and in combination, will vary according to the criterion used (terminal aspirations of actual entry).

B. The residuals (differences between predicted disposition and actual criterion scores) can be partly explained by certain, identifiable factors in the undergraduate environment. These factors affect a student's disposition to seek post-graduate training (defined as both expressed aspiration and actual entry). (See "Variables" for complete listing of factors).

1. The following factors in the college environment are related to a student's decision to seek advanced training:

    a. Length of exposure to college

    b. College press (demands and expectations of both faculty and peers)

    c. College experiences and activities

2. (Implicit) The predictive value of these factors will vary according to the criterion used.

3. There are qualitative differences between lower class and upperclass college environments (as reported by students).

   Similarly, there will be differences in the relative impact of these two environments with regard to students' disposition to continue education beyond the baccalaureate degree.

II-IV. Personal Development, Intellectual and Cognitive, and Vocational Development:

The study was exclusively concerned with the educational development of its respondents and did not, therefore, posit any hypotheses regarding these three areas of development.

DESIGN OF STUDY:

1. Longitudinal: four-year period (Fall, 1959; June, 1961; Fall, 1963) with test-retest on the same sample.

2. Investigation of pre-college (Fall, 1959) and college process factors (June, 1961, and Fall, 1963) affecting disposition to seek graduate training. Sample chosen from 140 colleges in the U.S.

3. Follow-up data on 2,919 respondents (from a designated sample of 4,178) of an original 7,464 students. These 7,464, in turn, had been selected from a sample of 26,771.

4. Complete data was obtained on 39% of the original sample (2,919 of 7,464). Due to the original selection as well as response biases (see section on "Limitations of study due to sampling"), the final sample was not representative of a cross-section of all American college students. Furthermore, due to the response biases, the final sample was not even representative of the original sample, but increasingly, as each of the surveys were taken, biased toward higher aptitude students.

DESCRIPTION OF SAMPLE:

1. Size of sample:

| | Designated Number | Actual Number |
|---|---|---|
| Fall, 1959 | 30,000 | 26,771 (Res. Rt: 90%) |
| June, 1961 | 7,464 | 4,330 (Res. Rt: 58%) |
| Fall, 1963 | 4,178 | 2,919 (Res. Rt: 70%)* |

*Of the 2,919 respondents, only 1,970 had received baccalaureate degrees by September, 1963. Since the author was concerned only with the plans of college graduates, he used only these 1,970 responses, a number which shrunk to 1,772 useable forms.

2. Population: Originally chosen from 300,000 National Merit Scholarship Qualifying Test examinees, who had scored at a percentile rank of 64 or higher (national norms). These 300,000 were taken from a total of 480,000 students who had taken the test in their junior year (1958). This latter number represented 28% of all 1959 U.S. high school graduates.

3. Sex: Of the total final sample of 2,919, 1,230 were women and 1,689 were men. Of the final used sample of 1,970, 1,037 were males and 933 were females.

4. Racial composition: not reported

5. Religious composition: not reported

6. Special characteristics:

a. National Merit Scholarship Qualifying Test

| Percentile rank-national norms | Number in sample (N = 1,970) |
|---|---|
| 64-74 | 250 |
| 75-84 | 374 |
| 85-94 | 715 |
| 95-100 | 631 |

b. Major field:

| | Number in sample (N = 1,970) |
|---|---|
| Biological Sciences-Psychology | 222 |
| Physical Sciences | 460 |
| Humanities | 483 |
| Social Sciences-Education | 462 |
| Miscellaneous | 343 |

7. Sampling procedure:

Originally, a stratified random sample by state was taken (10% of the 300,000 NMSQT examinees scoring above the 64th percentile--1959). For the second, 1961, sample, a stratified random sample was taken by college: 140 colleges each having a minimum of 35 or more of the NMSQT examinees who responded to the first survey. Names were stratified by college and a random sample was chosen of 60 names from colleges with more than 60 examinees and all names of the stratum contained between 35-60 names. Approximately 42 states were represented in the sample, although the selection of schools by such criteria enrollment (choice of NMSQT examinees) further limits the type of colleges comprising the sample.

The third sample, Fall, 1963, consisted only of respondents who 1) had completed forms for the first two surveys, and 2) had indicated in June, 1961, that they were progressing through college (not withdrawing temporarily or otherwise) in the usual manner.

8. Limitations of study due to sampling:

   a. The major limitation of the study is due to its sampling procedures. Although the author purports to be investigating factors in college environments which motivate a student to seek graduate training, the biggest response bias in his study is that of higher aptitude students. Since Thistlethwaite is defining environmental factors in terms of subjective judgments of these students, the question of direction of causality is a crucial one: does the type of environment described by students affect their values or do their values affect their perception of that environment?

   b. The 480,000 1958 NMSQT examinees represented only 28% of all 1959 high school graduates. Although only half of all U.S. high schools offered that test in 1958, 85% of all high school graduates came from these schools. The author acknowledges that students from high schools which administer the NMSQT test are more likely 1) to plan to go to college, 2) to have parents who encouraged them to do so, and 3) to take college preparatory courses--than students in non-participating schools.

   c. In the second survey (June, 1961, when the respondents would ordinarily have completed their sophomore year of college), there was a low response rate (58%), with a bias towards more women than men (63% to 55%) and more high NMSQT scores.

   d. Further selectivity occurred in the third survey when only the respondents to the first two surveys were sent forms. Again, the response bias favored students with both higher NMSQT scores and higher G.P.A.'s (as reported in 1961) as well as favoring those students who had indicated higher educational aspiration levels in 1961.

e. The author states, regarding this increasingly disproportionate response bias, "However, the purpose of this study was not to estimate the proportion of all college graduates who continue their training in graduate or professional schools, but rather to study factors influencing such plans. Consequently, these response biases were not serious vitiating conditions, though they, of course, limit the population to which our results may be generalized." (p. 26)

In fact, the response biases were important, since the generalizations were limited to a population already predisposed to seek graduate training, and furthermore, such biases cast doubt upon the validity of the independent impact of the various college press factors studied.

VARIABLES STUDIED:

1. Pre-college characteristics: (as determined in 1959)
   - a. Sex
   - b. Educational aspiration level
   - c. National Merit Scholarship Qualifying Test Score (1958)
   - d. Father's educational level
   - e. Mother's educational level
   - f. Number of freshman scholarship applications (1959)
   - g. Family financial resources, 1959 (not specifically defined)
   - h. Probable major field of study (as intended in 1959): Humanities, Physical Sciences, Biological Sciences-Psychology, Social Sciences, Miscellaneous majors.
2. College environment variables:
   - a. College press: demands and expectations characterizing a student's college teachers and peers.
     - (1) Lower class (freshmen and sophomores) press: Faculty press for affiliation, directiveness, enthusiasm, achievement, compliance, supportiveness, humanism, independence, vocationalism; Student press for competition, estheticism, reflectiveness, social conformity, intellectualism.

(2) Upper class (juniors and seniors) press (major field, faculty and peers): Faculty press for positive evaluations of ability, high academic standards, independent thinking, intellectual values, advanced training, convergent thinking, affiliation, compliance, faculty as good role models, excellence of faculty, availability of faculty, faculty structuring of major field;
Student press for intellectualism, unfavorable self-evaluations, status, openness to experience, student cohesiveness, rebelliousness, playfulness, opposition to faculty influence.

b. Other experiences and activities:

(1) Grade point average (Cumulative)

(2) Friends in graduate school (1963)

(3) Awards and honors (scholastic)

(4) Atypical undergraduate curricular experiences (honors programs, research)

(5) Extracurricular activities

3. Outcome variables

a. Educational aspirations to graduate level

b. Entry into graduate or advanced training

INSTRUMENTS AND MEASUREMENT:

1. Instruments used to measure pre-college characteristics of students (1959) not presented or described by authors.

2. Survey of Career Plans of College Students, designed to Measure:

a. Educational plans

(e.g. long-range educational plans, graduate or professional school; number of applications submitted to graduate schools; reasons for not going to graduate or professional school)

b. Career plans

(e.g. anticipated career)

c. College activities and experiences

(e.g. grade point average; extracurricular activities)

3. College Press Scales: (Press is defined as the demands and expectations of the environment as perceived by the respondent)

a. Lower class press scales (lower division), adapted from Stern's (1958) College Characteristics Index plus author's additions designed to measure student's perception of his college environment, including both faculty and student press.

(e.g. Faculty press for Directiveness--"It is easy to take clear and systematic notes in courses here";

Student press for Estheticism--"When students get together they often talk about trends in art, music or the theater")

b. Upper class press scales (upper division), adapted from items suggested by Adelson, 1962; Brown, 1962; Davis, 1963; Newcomb, 1962; Nunnally, et al., 1963; Pace and Stern, 1958; Stern, 1962, designed to measure students' attitudes and perceptions regarding teachers in their major field and peers.

(e.g. Faculty press for Positive Evaluations of ability--"Their evaluations of my academic performance convinced me that I had a flair for course work in this area";

Student Cohesiveness--"There was a great deal of borrowing and sharing among the students in my social group)

STATISTICAL PROCEDURES:

1. Multiple Regression Analysis: using both pooled sample and standardized cross validation samples.
2. Factor analysis conducted on the college press scales.
3. Correlation tables, cross-tabulations and frequency distributions.
4. No multiple correlation analyses were conducted for the combined pre-college characteristics and college press factors.

## MAJOR FINDINGS:

### I. Educational Development

A. There was a predictive relationship between certain pre-college characteristics and disposition to do post-graduate work, and the predictive value of these variables varies according to the criteria used.

1. "Disposition" defined as terminal aspirations

    a. Only two pre-college characteristics were significant predictors for women:

    (1) initial aspiration (1959) level (.23)

    (2) National Merit Scholarship Qualifying Test scores (.15)

    b. Six pre-college characteristics were predictive for males' terminal aspirations for post-graduate work:

    (1) initial aspiration level (.39)

    (2) NMSQT score (.22)

    (3) intended major as biological sciences or psychology (.21)

    (4) Father's level of education (.15)

    (5) intended major as physical sciences (-.14)

    (6) number of scholarship applications submitted in freshman year (.10)

    c. Sex as an independent variable had a correlation coefficient of .37, in favor of men, to terminal aspiration level.

    d. Multiple correlations for predicting aspirations from the total eight pre-college characteristics are:

    (1) men: .451 (.402 when cross-validated)

    (2) women: .275 (to .233 when cross-validated)

    (3) pooled sample: .507

2. "Disposition" defined as entry into graduate training

    a. Four pre-college characteristics were significant predictors of immediate entry into advanced training:

        (1) initial aspiration level (.39)

        (2) sex (.35 in favor of males)

        (3) NMSQT score (.24)

        (4) Father's educational level (.15)

    b. By sex, women:

        (1) initial aspiration level (.23)

        (2) NMSQT score (.23)

        (3) Father's educational level (.20)

        (4) Mother's educational level (.13)

    c. Men:

        (1) initial aspiration level (.34)

        (2) NMSQT score (.20)

        (3) Father's educational level (.24)

        (4) Mother's educational level (.17)

        (5) major in biological sciences or psychology (.15)

    d. Using all pre-college variables as predictors of entry into advanced training, there is a multiple correlation of .485 (pooled sample).

        (1) men: .418(.332 when cross-validated)

        (2) women: .370 (.245 when cross-validated)

    e. For either criterion,aspiration or entry, men were more predictable than women.

3. The hypotheses that any of the following variables were significant predictors of the criteria were rejected:

    a. Aspiration:

        (1) family financial resources (.03)

        (2) major field as Humanities (-.05)

        (3) Physical Sciences (.06)

        (4) Social Sciences (-.11)

        (5) Miscellaneous fields (-.06)

        (6) Mother's educational level (.06)

    b. Entry:

        (1) family financial resources (.09)

        (2) major field as Humanities (-.30)

        (3) Social Sciences (-.12)

        (4) Miscellaneous fields (-.11)

(Hypothesis A confirmed)

Note: the relative predictive value of a biological or psychology major comes partly from the fact that the author included in this joint category pre-medical and pre-dental majors.

B. Certain factors in the undergraduate environment affected a student's disposition (aspiration and entry) to do post-graduate work.

1. Length of exposure: whatever the subgroup, sex, NMSQT scores or major field, the more exposure a student had to college, the more likely he was to express aspirations to do post-graduate work:

    a. The greatest increase in expressed desires to seek advanced training occurred in the last two years of undergraduate work. In 1959, at the beginning of college, 52% of the sample planned to pursue graduate studies; in June, 1961, 60% had such plans; and in Fall, 1963, 85% expected to work toward advanced degrees.

b. Sex: more women than men increased their educational aspirations in the course of undergraduate work. In 1959, 2/3 of the men planned to do graduate work compared to 1/3 of the women. In 1963, 89% of the men and 78% of the women expected to do so.

c. NMSQT scores: the higher the score, the more likely a student was to seek advanced education at all three times of survey; but low-aptitude groups showed the most change in raising their aspirations over a four-year period.

d. Major field: students who in 1959 stated their intention to major in the biological sciences or psychology entered with and maintained higher aspirations than those in other fields. Women in the physical sciences, unlike their male counterparts, also held and maintained post-graduate study aspirations. The greatest increases in aspirations were exhibited by graduates with degrees in social sciences, education and "Miscellaneous" fields.

e. In sum, the aspiration to seek advanced education develops at different times for different groups. For men, it occurs in the early or pre-college years, and the same is true of high scorers on the NMSQT and of those who intend to major in the biological sciences and psychology. Such goals develop later among women, low aptitude students and social science, education and "Miscellaneous" majors.

f. Finally, it should be noted that there was a much greater discrepancy between the aspirations to enter and actual entry of women into graduate school than there was between the same criteria when men were considered: of all 1963 respondents, 84% planned to go on to graduate school, while only 45% did so; 78% of the women indicated that they planned to attend graduate school, but only 27% actually enrolled in the Fall, 1963. Eighty-nine percent of the male respondents planned to do advanced work and 62% were actually enrolled.

(Hypothesis B confirmed)

2. College Press: the following hypotheses were confirmed (as measured by both aspiration and entry criteria):

   a. The motivation to seek advanced training was strengthened by:

      (1) good teachers in the major field

      (2) an upperclass environment where there was strong press from peers for intellectualism or where many peers planned to do advanced work

      (3) major field professors who gave positive evaluations of a student's ability

   b. The disposition to seek advanced training was weakened by the following factors:

      (1) teachers who required rigid adherence to course and curricular requirements

      (2) teachers who emphasized the vocational aspects of education

      (3) student subcultures which exhibited press for participation in "play or spectator activities".

   The following hypotheses were partly confirmed (by only one of the two criteria):

   a. A student's disposition to enter graduate training was strengthened by exposure to lower class teachers and peers who exerted humanistic and intellectual presses.

   b. Such a disposition was weakened where peers exerted press for social conformity or status.

   The study failed to confirm these hypotheses:

   a. The disposition to do post-graduate work was not strengthened by:

      (1) a lower class environment exhibiting strong faculty affiliation

      (2) faculty affiliation and availability in the major field

   b. The disposition to do post-graduate work was weakened by upper class peers exerting press for negative self-evaluations.

3. College experiences and activities: the following were confirmed for both criteria:

   a. Disposition to seek graduate training was strengthened by:

      (1) participation in honors programs, graduate-level courses and research projects

      (2) recognition, such as awards, of academic achievements

   b. The hypothesis that the predictive value of college environment factors will vary according to the criterion used. (see section B.1)

   The hypothesis was also partly confirmed that there is a difference between lower class and upper class environments.

   a. The study indicated that the types of college press reported by respondents varied with respect to lower and upperclass environments; that is, the press scales of each did not correlate highly with each other.

      The author notes, however, that this may be due to the wording of the instructions, which asked students in the lower class (1961) survey to describe the entire college environment, whereas, for the upper class scales, students were to describe faculty and peers in the major field. Thus, although the author feels there is some evidence supporting this hypothesis, confirmation is quite tenuous.

   b. More upperclass than lowerclass scales correlated with residuals.

RECOMMENDATIONS:

Based on the findings of his study, Thistlethwaite recommended that in order to increase the disposition of students to seek advanced training, colleges should:

1. Manipulate their environments so that the positive correlates previously discussed are accentuated and the negative ones are minimized, as for example in improving the quality of faculty.

2. Conduct more research on the kinds of student subcultures contained in each institution.

3. Increase the chances for undergraduates to participate in research projects, honors programs and graduate-level courses and also offer recognition for academic achievement.

## EDUCATIONAL DEVELOPMENT

Correlations between Predictors and 1963 Aspirations to and 1963 Entrance in Graduate School

| | Aspirations | Entrance |
|---|---|---|
| I. PRE-COLLEGE VARIABLES | | |
| A. Family Environment | | |
| 1. Father's educational level | | |
| a. Men | .15** | .24** |
| b. Women | .04 | .20** |
| c. Total | .10* | .15** |
| 2. Mother's educational level | | |
| a. Men | .08 | .17** |
| b. Women | .05 | .13** |
| c. Total | .06 | .11** |
| 3. Family Financial Resources | | |
| a. Men | .03 | .10* |
| b. Women | .08 | .11* |
| c. Total | .03 | .09 |
| B. Student Variables | | |
| 1. Sex | | |
| a. Men | | |
| b. Women | | |
| c. Total | .37** | .35** |
| 2. National Merit Scholarship Qualifying Test Scores (aptitude) | | |
| a. Men | .22** | .20** |
| b. Women | .15** | .23** |
| c. Total | .22** | .24** |
| 3. Initial Educational Aspiration level | | |
| a. Men | .39** | .34** |
| b. Women | .23** | .23** |
| c. Total | .43** | .39** |

* $P < .05$

** $P < .01$

| | Aspirations | Entrance |
|---|---|---|
| 4. Number of freshmen scholarship applications | | |
| a. Men | .10* | .10* |
| b. Women | .06 | .08 |
| c. Total | .10** | .10** |
| 5. Probable major field: | | |
| a. Humanities | | |
| (1) Men | .06 | .06 |
| (2) Women | .03 | .10* |
| (3) Total | -.05 | -.03 |
| b. Physical Sciences | | |
| (1) Men | -.14** | -.07 |
| (2) Women | .00 | .00 |
| (3) Total | .06 | .14** |
| c. Biological Sciences-Psychology | | |
| (1) Men | .21** | .15** |
| (2) Women | .03 | .07 |
| (3) Total | .15** | .13** |
| d. Social Sciences | | |
| (1) Men | .00 | -.01 |
| (2) Women | -.01 | -.04 |
| (3) Total | -.11** | -.12** |
| e. Miscellaneous majors | | |
| (1) Men | -.06 | -.07 |
| (2) Women | -.04 | -.11* |
| (3) Total | -.06 | -.11** |
| C. Multiple correlation on eight variables | | |
| 1. Men | .45 | .42 |
| 2. Women | .27 | .37 |
| 3. Total | .51 | .48 |

$* p < .05$

$** p < .01$

Correlations between College Variables and Residual Criteria Measures

(All 1963 Graduates)

| | Aspirations (1963) | Entry (1963) |
|---|---|---|
| II. COLLEGE PRESS VARIABLES | | |
| A. Excellence of Faculty in Major Field | .05* | .06* |
| B. Lower class Humanistic-Intellectual Press | .04 | .07** |
| C. Faculty Press for Compliance and Vocationalism | -.08** | -.08** |
| D. Student Camaraderie | -.07** | -.11** |
| E. Upper class Student Intellectualism | .10** | .03 |
| F. Lower class Faculty Affiliation | .01 | .00 |
| G. Upper class Student Competition | -.05** | -.10** |
| H. Lower class Social Conformity | -.10** | -.02 |
| I. Upper class Press for Status | | |
| J. Affiliation of Faculty in Major Field | .04 | .02 |
| K. Inflexibility of Faculty in Major Field | | |
| III. COLLEGE EXPERIENCES | | |
| A. Peers--more than half of close friends entered graduate school in 1963 | .16** | .18** |
| B. Faculty evaluations--G.P.A. (Undergraduates) | .16** | .20** |
| C. Awards and Honors: | | |
| 1. Deans List | .08** | .11** |
| 2. Graduated with honors | .11** | .08** |
| 3. Elected to honor society (excluding Phi Beta Kappa) | .07** | .11** |
| 4. Phi Beta Kappa | .08** | .10** |
| 5. Won academic scholarship | .05* | .07** |
| 6. No special honors | -.09** | -.07** |

*P < .05 **P < .01

| | (All 1963 Graduates) | |
|---|---|---|
| | Aspirations (1963) | Entry (1963) |
| D. Curriculum: | | |
| 1. Took one or more graduate courses | .11** | .08** |
| 2. Took part in Honors program | .07** | .07** |
| E. Research Experience: | | |
| 1. Never did any original research | -.08** | -.09** |
| 2. Did own research project | .10** | .10** |
| 3. Research Assistant for faculty member | .12** | .10** |
| 4. Off-campus research job | .04 | .07** |
| 5. Summer research training program | .10** | .08** |
| F. Extra-curricular activities--Actively participated in: | | |
| 1. Fraternity or sorority | -.04 | -.01 |
| 2. Campus group involved in National and World Affairs | .05* | .04 |
| 3. Musical or dramatic organization | .02 | .05 |
| 4. Editorial staff of campus publication | .01 | .04 |

* $P < .05$
** $P < .01$

CRITIQUE OF THE STUDY:

1. The author should have included the initial (1959) survey instruments in his appendices, particularly for the purpose of defining the variables under investigation such as "Family's Financial Resources".

2. Pre-medical and pre-dental students should have been excluded from the Biological Sciences-Psychology major field category since their inclusion biases this category towards greater aspiration and entry rates.

3. There is a lack of parallelism in analyzing and reporting the results. For example, correlation analyses were not performed on major field at graduation. That information, unlike other information is reported in gross percentages.

4. It is not clear how the pre-college predictors were isolated from the college-press variables. The author tries to use college press factors to account for adjusted criterion scores (the difference between entrance and actual entrance rates). The difference between predicted criteria and actual scores regarding both entry and aspiration (the dependent variables) are to be explained by college press factors. Yet his predictions are made upon the same results as are the correlation of college press variables. Multiple regression analysis should have been used for both pre-college predictors and college press factors.

5. Cross-validation procedures are used but the cross-validation groups are composed entirely of members of the original sample.

6. The validity of using subjective perceptions of the college environment for the purposes of making generalizations and recommendations must be questioned because the direction of causality is not known. It may well be that, due to the heavy response bias toward higher ability students, the respondents' perceptions of their environments may be the result of their predisposition to attend graduate school rather than of the environments which are characterized as affecting their decisions. The author acknowledges this possibility and states that it was not possible to correct this. Perhaps this criticism would be less serious if the author had used a more representative sample of undergraduates.

7. Although the 1961 and 1963 instruments overlapped in content somewhat, for example, "Faculty Press for Affiliation", many items in the scales were worded differently, or the scales contained entirely different statements (e.g. compare Scale 10, upperclass press to lower class press, both measuring "Faculty Press for Affiliation").

In addition, students received a different set of instructions regarding the reference group for each form: in 1961, they were asked to characterize the entire college environment (faculty and peers), while in 1963, they were directed to characterize faculty and peers in their major fields only. In spite of these differences, the author hypothesizes that lower class environments differ from those of upper class and that it is the upperclass presses which exert the strongest pressures on students to seek advanced training. These findings, in light of the disparate quality of the 1961 and 1963 forms, are questionable.

The author notes that in the 1963 form, the two criterion questions regarding aspirations and entry are juxtaposed and that this may have influenced responses; that is, because they are found together, students may have answered questions regarding aspirations and entry similarly (either positively or negatively) regarding disposition to go to graduate school.

8. Aspiration to seek advanced training appears to be a weak dependent variable and involves the problem of evaluating attitudes and attitude changes. How much, for example, does stated desire to go to graduate school reflect real conviction as opposed to stereotypic responses which the respondent feels is expected of him. In fact, the closer to graduation from college a student gets, the more his response might be expected to be based on peer group values and expectations and not on what he really wishes to do. The correlation between aspirations and eventual (not necessarily immediate) entry into graduate school should be examined.

   The author defined the entry criterion as immediate entry into graduate school (Fall, 1963, at the time of the final survey). The survey questions are phrased so that a student who was postponing entrance longer than one year would be missed. It is possible that many 1963 graduates might have had plans to join the Peace Corps which was the subject of much public interest at that time, and delayed their entrance into graduate school until after their two years with the Corps was over. This is just one possible source of error in determining factors involved in immediate entry.

The author doubts the aspirations of many respondents who said they aspired to go to graduate school but were not immediately entering. Many of those college graduates who aspired to graduate school but did not enter said that they did not go on because of financial reasons (53 percent of non-entering aspirants). Since 83 percent of these students had not applied for financial aid, the author concludes that this may indicate actual lack of desire to seek advanced training. Such a conclusion does not take into consideration such factors as need for immediate employment or ignorance of financial aid available in graduate school.

9. The author's conclusions concerning both aspiration to and entry in graduate school are not compelling. Several crucial questions remain unanswered.

   a. Were those students who entered graduate school immediately but withdrew similar to those students who finished an advanced degree or program?

   b. Were those students who entered graduate school similar to those students who had aspirations to advanced degrees but did not enter graduate school?

   c. How many of the students who entered graduate school persisted and obtained an advanced degree?

   d. Were those students who obtained an advanced degree different from those who entered graduate school but did not complete an advanced degree?

AUTHOR: Tillery, Dale

TITLE: Scope: School to College: Opportunities for Post-secondary Education

PUBLISHER: Center for the Study of Higher Education, University of California, Berkeley, 1966

MAJOR ISSUES:

Each student, as a result of his unique background, characteristics, and environment, will have different school experiences and will define for himself a pattern or channel through the school years and into postsecondary life which differentiates him from other students.

If there are identifiable patterns or channels which describe the chain of experiences and choice behavior, these patterns should be analyzed in light of immediate student outcomes as students distribute themselves among colleges and universities with different characteristics and among different occupations, and in terms of change or constancy over times.

It is important to determine the extent to which various factors influence students' decision-making so that ultimately high school and college experiences can effectively assist students in the decision-making process.

OBJECTIVES OF THE STUDY

General Objectives:

1. To determine if students, defined according to factors derived from measures of personal characteristics, family background variables, and indices of educational opportunities, have different school experiences, aspirations and attitudes, and make different decisions which lead to differential post-secondary outcomes.

2. To determine the process (how, when, and why) of students educational and career decision-making during high school years; the relative influence that parents, schools, and peers have upon the nature of those decisions; and when various stages in the decision-making process occur.

Specific Objectives:

1. To describe and differentiate the patterns of student behavior involved in making choices of colleges and diverse ways in which students acquire information about colleges and vocations.
2. To analyze the differences among defined clusters of students at cross-sectional periods.
3. To analyze change or constancy of these groups over time, particularly in reference to major outcome variables in the post high school year.
4. To study the students who deviate from the peer groups on important variables.
5. To find out how well students do after graduation and how they view their decisions in retrospect.
6. To assess the congruence between students' perceived strengths and their stated aspirations.

DESIGN OF STUDY:

1. Longitudinal: six-year period, with test-retest on the same sample. Three major testing periods at grades nine, twelve and near the close of the first year of high school.

   Data collected from school records, brief follow-up questionnaires and selective interviews for interviewing years (grades 10 and 11).

2. Follow-up data was obtained in 1968 for the 1966 9th grade sample; in 1970 for drop-outs and other sub-groups.
3. Cross-sectional data was analyzed as well as data from randomly selected sub-samples of students who attended college and students who did not attend college.
4. Students in the cross-sectional studies were stratified by sex and by educational aspiration. The five aspirational levels are:
   a. Leave school as soon as possible.
   b. Graduate from high school.
   c. Attend junior college or some special technical-vocational school.
   d. Graduate from a four-year college.
   e. Seek a post-graduate college degree.

TIME SCHEDULE*

| | 1965 | 1966 | 1967 |
|---|---|---|---|
| ring | | Refine test instruments 9th and 12th grades<br>Code and clean sample rosters<br>Print, code, mail, test materials<br>Orient school and state representatives<br>Test students, 9th and 12th grades<br>Clean answer sheets<br>Student-staff interviews<br>Administer school staff questionnaires | Analysis of transcript records of intact samples<br>Substudies of selected students from 9th grade sample<br>Student interviews<br>Preparation of 9th grade report<br>Test college freshmen<br>Identify follow-up of first semester college dropouts<br>Prepare instruments for scoring<br>Prepare preliminary publications on high school studies |
| ummer | | Score instruments<br>Order data on tapes<br>Begin computer analysis<br>Identify dropout and correction of rosters<br>Preliminary development of college rosters<br>Establish relations with colleges and universities<br>Roster of non-college-goers | Data analysis of substudies<br>Publication of 9th grade reports<br>College Fresh. Study: score, order, data computer analysis<br>Follow-up of non-college sample and college dropouts<br>Plan prelim. 1966 high school senior study publication |
| all | Employ staff<br>Establish state, district, and school relations<br>Select 9th and 12th grade samples<br>Construct test instruments for 9th and 12th grades<br>Construct instruments for counselors, faculty, admin.<br>Refine data processing procedures and logistics | Data analysis<br>Follow-up of dropouts 9th grade samples<br>Analysis of data on school environment<br>Student-staff interviews<br>Identify college-goers and institution of choice<br>Orient college repres.<br>Refine college freshmen instruments<br>Print, code, and mail college instruments<br>Follow-up of sub-samples of non-college goers<br>Student interviews | Substudies of 9th grade sample (interviews)<br>Analyses of high school and college data<br>Prepare preliminary reports on college freshmen<br>Publish 1966 high school senior studies<br>State or regional conferences in cooperation with CEEB |

Chart 1. SCOPE Project
Follow-up Procedures for Locating 1966 Twelfth Graders

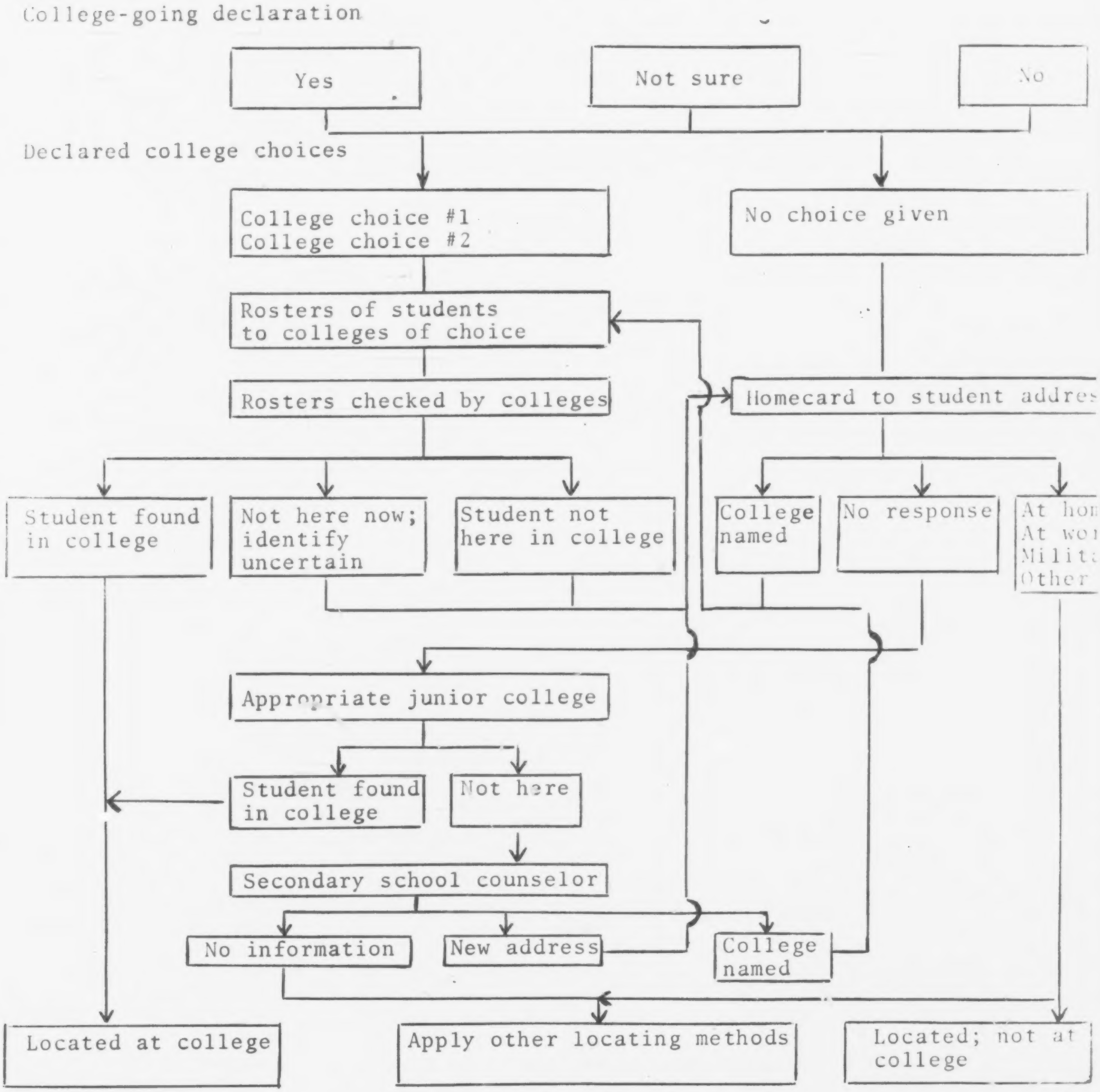
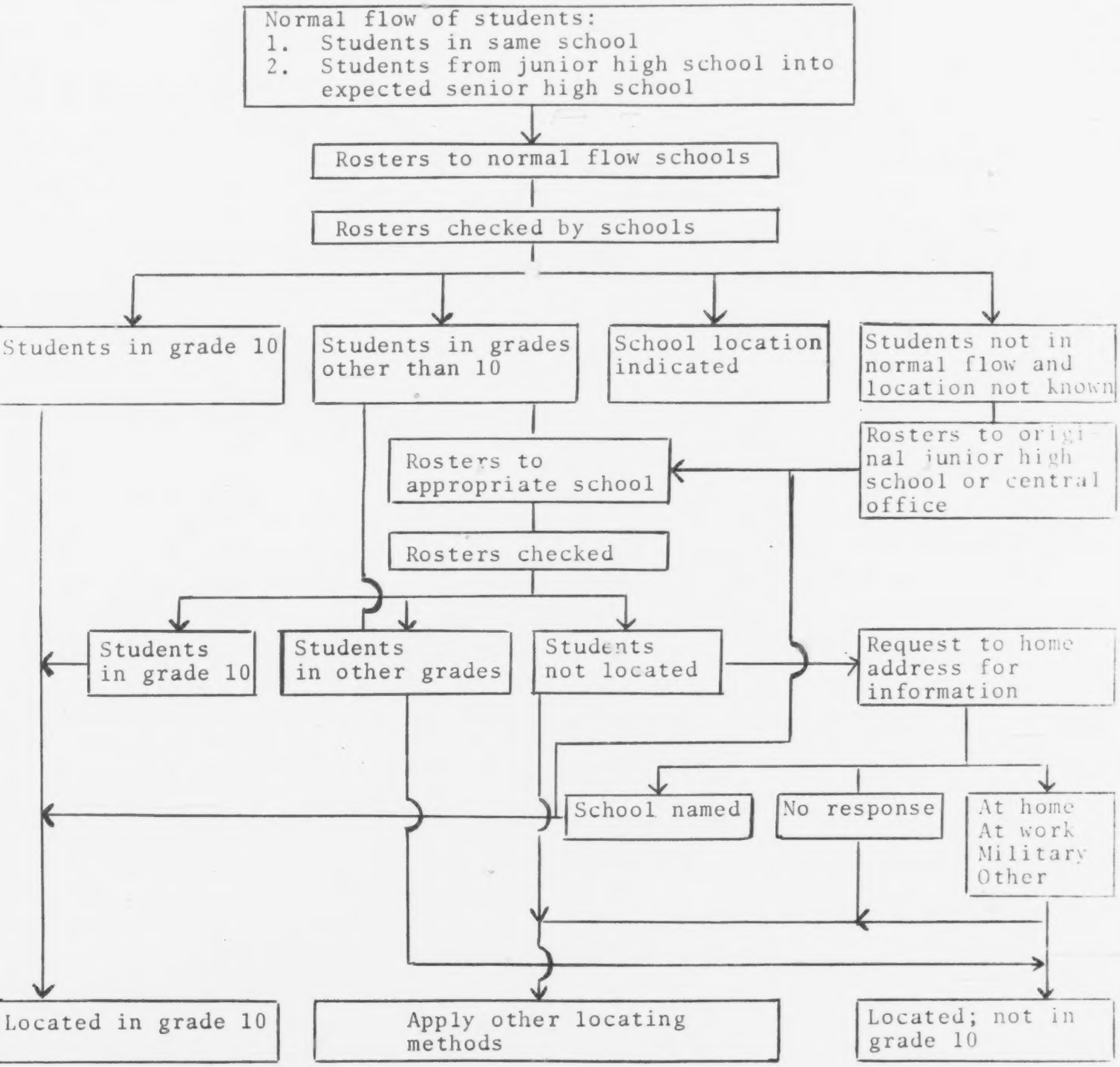


Chart 2. SCOPE Project
Follow-up Procedures for Locating 1966 Ninth Graders


Normal flow of students:
1. Students in same school
2. Students from junior high school into expected senior high school
Rosters to normal flow schools
Rosters checked by schools
Students in grade 10
Students in grades other than 10
School location indicated
Students not in normal flow and location not known
Rosters to original junior high school or central office
Rosters to appropriate school
Rosters checked
Students in grade 10
Students in other grades
Students not located
Request to home address for information
School named
No response
At home
At work
Military
Other
Located in grade 10
Apply other locating methods
Located; not in grade 10

DESCRIPTION OF SAMPLE:

1. Size of sample:

| 9th graders | | 12th graders | |
|---|---|---|---|
| 8,204 | California | 7,757 | |
| 14,338 | Illinois | 10,881 | |
| 11,673 | Massachusetts | 9,793 | |
| 21,846 | No. Carolina | 12,555 | |
| 56,061 | | 40,986 | Total 97,047 |

Through the use of appropriate theoretical models, it was determined that 3,954 students should be available for the final data collection in each of the four states. The initial sample sizes then took into consideration persistence rates and drop-out rates of students through each period of schooling, college-going rates in the four states, and a general persistence rate during the first year of college.

Units of sampling: Individual schools
244 public schools
55 non-public schools

2. Population: All 9th and 12th grade students enrolled in high school in the spring semester, 1966 in California, Illinois, Massachusetts and North Carolina.

Four states chosen on the basis of the following criteria:

a. They have different traditions regarding commitments to public and private higher education.

b. They reflect the traditions and educational beliefs of the major regions of the nation, although they cannot be considered statistically representative of such regions.

c. They represent leadership in major aspects of higher education.

d. They have recent master plans for higher education.

3. Racial composition: not reported.

4. Religious composition: not reported.

5. Sampling procedure:

Multi-state stratified proportional random-sampling procedure.

a. Counties in each of the states were statistically grouped into similar clusters on the basis of:

(1) median family income

(2) proportion of white collar workers

(3) white and nonwhite racial composition

(4) mobility of the population

(5) rate of school attendance of school age children

(6) school size

(7) ratio of students who go to college to high school graduates

b. Counties were then randomly selected from within each cluster of counties in each of the four states.

c. School districts, then schools, were randomly selected from within the selected counties so that there would be samples of grade 9 and grade 12 students large enough to meet the requirements for the initial sample sizes.

d. Eight non-overlapping *a priori* clusters of students based on statistically defined factors were established at the beginning of the longitudinal study. The eight clusters are defined in reference to three dimensions:

(1) High/low "school ability"

(2) High/low family socioeconomic status

(3) High/low educational opportunity

6. Limitation of study due to sampling:

a. The authors state that caution should be used in making generalizations about students as a result of examining the data since some students were away when the testing was done and some students chose not to participate. It is not known what effect this may have upon the representativeness of the state samples.

b. Loss of a large metropolitan school district in Massachusetts which chose not to participate was not replaced by other volunteer schools. The public school systems are underrepresented in both grades 9 and 12 with respect to some of the characteristics of large urban areas.

With respect to the four-state composite, however, the size of the sample and range of types of schools sampled should reflect the attitudes, abilities and interests.

STATISTICAL PROCEDURES:

1. Analysis of Principal Components

2. Cross-sectional Analysis of Cluster Differences

   a. Analysis of variance and covariance

   b. Wilcoxon test for matched samples with ranks
   c. Bartlett's test for homogeneity of variance
3. Cross-Sectional Multivariate Discriminant Analysis
4. Longitudinal Analysis of Clusters
   a. Chi square test for significance of changes
   b. Markov process for measuring changes and constancy
   c. Friedman's test
   d. Pearson's rank correlation coefficient
   e. Multiple regression methods
5. Longitudinal Multivariate Discriminant Analysis of Clusters
6. Analysis of Membership of Student Clusters
   a. Markov Analysis
   b. Multivariate analysis of variance
   c. Hotelling's $T^2$

INSTRUMENTS AND MEASUREMENT:

Student questionnaires developed by staff designed to measure:

1. Proficiencies, talents (e.g. artistic, scientific, athletic, hobbies, interests)
2. Socioeconomic status
   a. Parents' occupational level
   b. Parents' educational level
   c. Parents' income
   d. Style of living
      (1) Number of books in home
      (2) Physical environment of home
      (3) Cultural environment of home

e. Composition of home

f. Marital status of parents and of student

g. Number of siblings

h. Birth order of student

i. Adults other than parents in home

3. Psychological environment of home (e.g. parental attitude toward school and learning; family cohesiveness; sibling rivalry; encouragement of dependence-independence)

4. Patterns of identification with peer group values (e.g. independence or dependence on peer group values)

5. Influence of others (e.g. helpfulness of others; perceived characteristics of others, parents, school personnel, ideal person, congruence of ideal with school personnel)

6. Decision-making process including information-seeking behavior regarding education and career (e.g. what decisions have been made or contemplated and why at high school level; assessment of the decisions made and experiences which led to these decisions at the college level; perceived barriers to college and decisions)

Academic Ability Test (AAT) developed by Educational Testing Service designed to measure:

Differential academic aptitude (e.g. verbal, numerical, mechanical, and spatial skills)

Adaptation of the Edwards Personal Preference Schedule and Gough's Adjective Check List designed to measure:

Need for achievement-motivation

Adaptation of the Omnibus Personality Inventory and the Allport-Vernon-Lindzay Study of Values designed to measure:

Intellectual orientation, social autonomy, attitudes and values (e.g. attitudes toward school, college and society; identification with the establishment; values, attitudes, and beliefs toward social issues)

Willingham's Bi-factor Interest Screen designed to measure:

Vocational interests

Principal questionnaires developed by staff designed to gather basic data about schools and their personnel

VARIABLES STUDIED:

1. Student Variables
   - a. Academic aptitude and achievement
   - b. Achievement motivation
   - c. Educational and vocational aspiration (e.g. how long student expects to stay in school)
   - d. Interests, hobbies, talents
   - e. Values, attitudes, beliefs
   - f. Physical health and development
   - g. Information seeking behavior regarding education and career
   - h. Race
   - i. Intellectual orientation
   - j. High school and college activities and attitudes toward the school experiences
   - k. Peer affiliation and peer culture (e.g. congruence of values with adult and school values; mores; age levels)
   - l. Social behavior
   - m. Problems and conflicts--personal and interpersonal

     (e.g. Is deciding what your college major will be a major problem now? When will it be [has it been] most difficult to choose between going to college to develop a philosophy of life or to prepare for a job? Has finding out about job requirements been a problem? Is what kind of a person to be a problem now?)
2. Environmental Variables--Family
   - a. Socioeconomic status measured by Father's occupation
   - b. Psychological climate of home
   - c. Physical environment of home
   - d. Composition of home

3. Environmental Variables--School
   - a. Curriculum (e.g. college prep, commercial, vocational)
   - b. Teachers (e.g. qualifications, teacher/student ratio, personality-intellectual orientation, values, attitudes, racial and ethnic prejudices, ways of typing students)
   - c. Counselors (e.g. qualifications, counselor/student ratio)
   - d. Resources and services of school (e.g. adequacy of buildings, equipment, class size, student services, personnel policies-tenure, etc.)
   - e. Objectives
   - f. Racial composition, integration
4. Environmental Variables--Community and State
   - a. Community characteristics (e.g. socioeconomic status of population, cultural opportunities, library facilities, commitment to education--proportion of money designated for school)
   - b. State influences
     - (1) master plans
     - (2) finances (e.g. fee and tuition schedules, availability of scholarship and loan aid)
     - (3) types of institutions available (e.g. public and private)
       - (a) Vocational specialized schools
       - (b) Junior colleges
       - (c) State colleges
       - (d) Universities
       - (e) Liberal Arts colleges
     - (4) governance of institutions (e.g. local versus central control)
     - (5) State plans for use of federal funds
5. Outcome Variables
   - a. Persistence
   - b. Transfer
   - c. Evaluation of educational decisions

## CHART 1

## CATEGORIES OF MAJOR STUDY VARIABLES

| 1966<br>9th grade | 1967*<br>10th grade | 1968*<br>11th grade | 1969*<br>12th grade | 1970*<br>1st year post-high school |
|---|---|---|---|---|
| Tests<br>Aptitudes<br>Interests<br>Motivation<br>Intellectual Orientation | Records<br>GPA<br>Courses-Program<br>Persistence<br>School Transfer | Study variables at 11th grade will replicate those at 10th grade | Tests<br>Aptitudes<br>Interests<br>Motivation<br>Intellectual Orientation | Records<br>GPA<br>Persistence<br>Outcomes<br>Institution of Choice |
| Questionnaire<br>Family Background<br>Peer Affiliations<br>Educational/Career Aspirations<br>School Activities/Attitudes | Brief Questionnaire<br>Guidance Activities/Attitudes<br>School/Career Decisions<br>Peer Affiliations<br>School Activities/Attitudes<br>Financial Data | | School Records<br>(See 10, 11 grades) | Questionnai<br>Evaluatio of Choi<br>College E perienc<br>Peer Affi liation<br>Living, F nancial Data<br>Education Career Plans<br>Reassessment of Educational Development |
| Environmental Assessment<br>Community Characteristics<br>School<br>1. resources<br>2. program<br>3. personnel<br>4. services<br>5. objectives | Interviews<br>When, Who, How Re: Decisions, Aspirations, Plans | | Questionnaire<br>Evaluation of H.S. Experiences<br>Educational/Career Decisions<br>Peer Affiliations<br>Financial Resources | Environment<br>Institutional Assessments |
| | | | Environmental Assessment<br>Community Characteristics<br>School (see grade 9) | |

* Follow-up of sub-samples of dropouts and non-college goers through use of multiple questionnaire appeals and selective interviews.

MAJOR HYPOTHESES:

I. Educational Development:

A. Students of high ability from high SES families, and in high educational opportunity environments will have access to more information about colleges and careers, at earlier times, and will make earlier decisions to go to college and attend specific types of institutions.

Students who frequently discuss educational and career plans with teachers tend to make more effective decisions about college than those who do not.

B. Measured student aptitude will consistently be the most potent single variable in discriminating among the established student clusters. Measures of socioeconomic status of family will progressively (Grades 9-12) be the most important variable in the distribution of students from the established clusters among different types of colleges and universities.

C. Students in the several clusters will distribute themselves in different ways among institutions of higher education. The formation of the college-going population will draw heavily from certain student clusters and not from others.

D. Student declarations of post-high school objectives at the several grade levels will be more alike in some student clusters than others. High ability, high SES students will declare plans to go to college. There will be more diversity of post-high school goals within those student clusters which are low on one or two of the three classification factors.

E. 1. Students will be better matched with their institutions of first attendance in state systems which facilitate transfer between junior and senior colleges than in systems which do not.

Appropriate choices of majors and migration of students among colleges after first admission will be related to the differentiated educational functions of the institution.

2. Institutions within formally coordinated systems of higher education will have fewer articulation problems than those not so coordinated. Local junior colleges will have fewer problems in curriculum coordination with secondary schools than will other types of institutions of higher education.

F. Types of secondary schools will be differentiated by the degree to which their personnel are aware and influenced by what is taking place in curriculum changes in higher education. High school personnel will be more aware and influenced by curriculum changes at major universities than they will be of similar changes in other types of institutions.

II. Personal Development:

A. The cluster of 17 variables entitled "Personal Propensities and Values" (composed of OPI variables plus 12 others) will distinguish among the four educational aspiration groups; the four socioeconomic status groups; and among the two racial groups (Caucasian, Negro).

The 17 variables are:

1. Autonomy (summation of 15 OPI items)
2. Theoretical Orientation (Summation of 3 OPI items)
3. Theoretical Orientation (Summation of 3 OPI items)
4. Thinking Introversion (Summation of 3 OPI items)
5. Thinking Introversion (Summation of 6 OPI items)
6. Leader (e.g. importance of being a leader)
7. Do well (e.g. importance of being able to do at least one thing very well)
8. Fight (e.g. importance of putting up a good fight when you compete with others)
9. Life aim (e.g. agreement: "By high school graduation people should know where they are headed in life and what they want to become.")
10. XPCTBEST (e.g. with friends I "expect the best of others".)
11. Hardwork (e.g. with friends I "like people who are hard workers".)
12. Work Ethic (Summation of 3 OPI items)
13. Protest (e.g. agreement: "Student protest movements do more harm than good.")
14. Commwork (e.g. agreement: "It's more important to work for the good of the community than for one's own self interests.")

15. Religion (e.g. agreement: "Attending religious meetings regularly is necessary to lead a good life.")

16. Vietnam (e.g. agreement: "It is morally wrong for a person to refuse to fight in Vietnam even if doing so violates his beliefs.")

17. Laworder (e.g. agreement: "Disrespect for law and order is the major problem in our society today.")

B. Affiliation with peer groups whose values are hostile to education will define subgroups which deviate from those clusters which predominately contribute to the college-going population.

When significant changes take place in the racial balance of high schools, any or all student clusters will produce deviant groups with respect to declared educational aspirations.

III. Intellectual and Cognitive Development:

A. Students' intellectual orientation scores (OPI) will differentiate among student clusters and type of college.

B. The extent of overlap in specific subject areas will vary depending upon the type of institution students attend and student dissatisfaction with such overlap will discriminate among the different clusters of students.

IV. Vocational Development:

A. Students' vocational interests scores will differentiate among student clusters and type of colleges.

B. Instability in reported plans for education beyond high school will be related to irrationality of vocational goals. This "syndrome" will differentiate among student clusters on the basis of the nature, amount, and timing of information-seeking behavior.

## MAJOR FINDINGS

### I. Educational Development

A. There is a positive relationship between level of student's educational aspirations and rank order of Significant Others student talks to about school problems.

1. More students with high aspirations talk with parents, school personnel, and the same-sex peer about school problems than students with low aspirations; more students with low aspirations talk with the opposite-sex peer than those with high aspirations.

2. More boys aspiring to a four-year college or beyond tend to talk with Father than with counselor while more low aspirants talk with counselor than with Father.

3. For girls, as for boys, Mother holds first rank; for girls, Best-Liked Girl ranks higher than teacher or Father. For boys, the reverse is true.

4. High aspirants tend to perceive parents and school personnel as more helpful than low aspirants; low aspirants perceive peers as more helpful than high aspirants.

5. Low aspirants find more help in the opposite-sex peer than in the opposite-sex parent.

6. Father is perceived as most helpful for boys; Mother is perceived as most helpful for girls.

7. The person with whom most students talk about school problems is not the person students find most helpful. For all aspiration groups, counselor and teacher are both perceived as more helpful than Mother.

B. The extent of concern with potential problems related to college and academic factors is directly related to student's educational aspirations.

   1. There is very little incongruity on the average, between actual and aspired grades and students' educational aspirations.

   2. Choosing between going to college to develop a philosophy of life versus going to college to prepare for a job is, on the average, not an immediate concern of high school seniors; they have dealt with this problem earlier or expect to deal with it in the future.

   3. Males in Illinois with two-year educational aspirations indicate that deciding what kind of student to be is more of a problem than do other groups; for females in North Carolina, this variable is negatively related to educational aspirations.

C. In general, educational aspirations are positively related to the extent to which the following are problems:

Deciding upon a college major

Finding out which college best suits one's interests and abilities

Deciding what to do if rejected by one's first choice college.

1. Students in California and Illinois who aspire to obtain a baccalaureate degree are more concerned with choice of a college major than students with the same aspiration in North Carolina and Massachusetts; males in Illinois and California with postgraduate aspirations are less concerned.

2. For females in North Carolina, relationship of these variables to educational aspirations depends on the SES of family. This dependency is not characteristic of the other state-sex groups.

3. For students of low and low-mid SES, there is a direct positive relationship between concern about being rejected by the college of choice and educational aspirations. However, students of high SES who aspire to postgraduate education also state this to be a problem.

   Students of mid-high SES with baccalaureate aspirations are very concerned about their choice of major.

Findings from the SCOPE data have been presented in the following published and un-published reports and working papers by Tillery and associates.

1. Tillery, Dale; Sherman, Barbara; and Donovan, Denis; "Helpfulness of Parents, School Personnel, and Peers to Students with Different Educational Aspirations," paper presented to the American Psychological Association,San Francisco, August 30, 1968.
2. Sherman, Barbara, Role Exploration in the Decision-Making Process of Adolescents. New York: College Entrance Examination Board, 1971, in press.
3. Working manuscripts of chapters from a book to be published by Dale Tillery and associates.

Data were analyzed for a sub-sample of "Bright No-Goes" (84 boys and 132 girls). At grade 9, they ranked in the upper third of the distribution of the total SCOPE sample on achievement (AAT); at grade 12 they reported no intention of attending any kind of post-secondary institution nor were they located in school a year later. The purpose of this analysis was to identify the personal, interpersonal and situational factors during the high school years which played a part in their decision not to attend college.

An additional purpose was to better specify in what ways and at what time school personnel can more effectively help students to formulate and pursue post-secondary goals which are in the best interests of students' total development.

## MAJOR FINDINGS

### I. Educational Development

A. Family environment

1. "Bright No-Goes" were more likely to come from families in which Fathers were skilled tradesmen rather than professionals.
2. They reported that "Parents not having enough money" and "not being able to earn enough money" have less influence on their plans not to attend college than either of the college-going groups (Short termers = plan to attend two years; High potentials = plan to attend four years of college).
3. Educational level of parents is about the same for No-Go boys and their Short-Term counterparts. For boys, the absence of parental models does not appear to be of great importance in explaining why No-Goes choose not to attend college, even for a limited time.

For girls more parents of Short-Termers have attended college than those of the No-Goes.

4. Parents of Short-Term girls tend to be more religious and more active in social groups; they tend to read more and to attend more concerts and lectures.

   Parents of No-Go boys tend to read more and attend more concerts and lectures than those of Short-Termers.

5. There was more dissonance between No-Go and Short-Term students' educational and career goals and those their parents want for them than for the High Potentials.

   a. No-Goes report less parental involvement in decisions about what classes to take than do Short-Termers.

   b. Parents of No-Goes show considerably less encouragement for the pursuit of higher goals than do parents of the Short-Termers.

   c. No-Goes don't feel as close to their father as do Short-Termers; No-Goes tend to find friends more helpful than father when confronted with both career and educational problems. The reverse is true for Short-Termers.

      Positive identification between Father and son is less strong for No-Goes than for Short-Termers.

      Lack of parental encouragement in the pursuit of educational goals is accompanied by a deep sense of alienation between student and parents--particularly Father.

6. No-Go girls come from more culturally disadvantaged homes than do Short-Term girls.

   Parents of No-Go girls are less encouraging than those of No-Go boys as well as Short-Term girls; the belief that "college is for men" is held especially among lower SES groups.

   There is a strong tendency for No-Go girls more than Short-Term girls to retreat from a positive identification with their mothers.

B. Perceptions of ability to do college work:

1. Considerably fewer No-Goes are convinced that they have the ability for college work than even the Short-Termers.

2. Lack of ambition (muted educational aspirations) is a key variable in becoming a No-Go.

   No-Goes rate themselves significantly lower in ambition than Short-Termers.

   Failure of No-Goes to assume responsibility for their own destiny.

   Students in No-Go group exhibited lack of self confidence, apathy, and pessimism. They are portrayed not only as underachieving but also as resentful, frustrated with their school program, and unresponsive to the help school personnel attempt to give them. The discontent with school combined with somewhat "disengaged" parents results in an apathetic attitude further aggravated by feelings of doubt, pessimism, and entrapment, alienation from the American way of life and alienation from themselves.

C. Perception of the Value of College

1. No-Goes, more than the two college-going groups feel that the "important things in life are not learned in college".

2. At grade 12, considerably more No-Goes than High Potentials are interested in making money, but Short-Termers were more similar to No-Goes than to their college-going friends.

   Thus, it is not the differences in career goals between the No-Go and Short-Term boys that accounts for the No-Goes' decisions not to enter a vocational training program.

3. More girls than boys see marriage as a barrier to college attendance.

   No-Go girls more than Short-Term girls see marriage as a barrier to college attendance. 22% of No-Goes compared to only 6.7% of Short-Termers hope to marry within a year after high school graduation.

4. The number of No-Go girls exceeds that of the other two female groups.

5. By grade 12, No-Go girls have more interest in "creating something original" while Short-Termers have more interest in "helping other people".

D. Educational Aspirations

1. There was a drastic decline in the educational goals of bright No-Goes (60% of No-Goes in grade 9 reported they wanted to complete at least four years of college).

   Fewer No-Go girls (1%) than boys (20%) are undecided about their educational plans at the end of grade 12.

2. There is a tendency for No-Go girls to relinquish earlier ambitions (e.g. 15% of the No-Go girls at grade 12 reported they were attracted to "creative" occupations but only 3.8% of these anticipated they would pursue such occupations).

3. In grades 9 - 11, 45% of No-Go girls considered attending a junior college or vocational school; few No-Go girls aspire to graduation from a four year college.

4. Although No-Go boys start out with higher educational aspirations, No-Go girls' level of involvement in school is considerably higher than that of boys over the four years of high school, as evidenced by the grades achieved.

5. The increase from grade 10 to 11 in number of No-Goes aspiring to only a high school education is paralleled by a general decrease in the distribution of both the grades they achieve and the grades they aspire to. There is a similar shift for Short-Termers but as a group their achievement and aspirations are higher than those of the No-Goes at grade 11.

6. Not enough bright No-Goes apply to college to make rejection by a college a significant factor in their non-attendance.

E. Sources of help

1. As evidenced by student responses to 18 behavioral statements as to "Ideal Helper", best-liked teacher, and counselor: No-Go boys and girls report teachers and counselors are not enough like them (e.g. "youthful") to empathize with their problems, or else they deal with them only superficially.

2. Girls tend to make more contact with school personnel about career goals than do boys. While boys are more "turned-off" by teachers, girls are by counselors.

Girls' best-liked teachers play a special role in their school experiences not apparent for boys; parents reinforce the girls' own aspirations, but best-liked teacher stands out as an "upward push" for considerably more girls than boys.

3. Best-liked teacher as well as siblings tend to be mentioned by more No-Goes than Short-Termers. They also seek help from friends when the problem concerns the broader issue of how to fit school work with post-secondary plans.

   (No-Goes are apparently not receiving the help they need from teachers and counselors).

CONCLUSIONS BASED ON ABOVE FINDINGS:

1. No-Go girls do not experience the same degree of entrapment that No-Go boys do (e.g. "not much to choose from"), yet significant numbers of these No-Go girls are closed to alternative forms of being (e.g. number of possibilities being considered).

2. No-Go boys can be identified primarily by underachievement accompanied by alienation from the "system". No-Go girls show neither the alienation or despair of the No-Go boys. The No-Go girl reflects traditional lower middle class values in both school achievement and in her renunciation of college or career plans which might act to retard marriage.

3. Short-Termers tend to be more fully ingrained in "the system" than do No-Goes. They have commitment to the work ethic, are more religious, and are more inclined to be interested in the various activities open to them. They tend to accept more responsibility for their present successes and failures and for their future goals.

   "Dropping out" of both school and peer culture may be in part the inevitable consequences of what appears to have been a dissatisfying high school experience for bright No-Goes.

4. Recommendation to change the developmental course of potential bright No-Goes, more innovative approaches in college-training and in-service programs of counselors and teachers must be instituted in order to move toward convincing youth as a whole that school personnel are genuinely interested in them as individuals.

ADDITIONAL FINDINGS:

An analysis of a sub-sample of SCOPE 1966 seniors who continued on to post-secondary education in 1969. (33,965 high school seniors in four states: California, Illinois, Massachusetts, and North Carolina).

The purpose of this analysis was to discover what happens educationally at the juncture between late childhood and youth. For a youth, the number and diversity of choices facing him is large, and few of the choices are direct and simple.

I. Educational Development

Distribution of college attendance

1. Slightly more than half of the high school graduates go to college and slightly less than half do not; enrollment in college is highly dependent on the availability of a college.
2. The high proportion of students migrating out of state are those with high achievement records and those who come from affluent families.
3. For the four states combined: 50.7% of 1966 12th graders were in some post-secondary institution in 1967; 47.6% had not gone on to further education and 1.7% were non-respondents.
4. A higher percentage of boys than girls attend Ph.D. granting institutions in Massachusetts and a larger percentage of both sexes attend community colleges in California than in the other three states.
5. California has a lower proportion (20.3% of the state sample of 7,567) of the "non-college did-not-plan-to-go" graduates than any of the other states (e.g. 1/3 of North Carolina's 11,377 sample).
6. College-goers followed the pattern of accessibility characteristic of their state: California with 74 community colleges in 1966 had 35% of its sample enrolled in the two-year colleges; Massachusetts had 28% of its sample enrolled in private and prestigious in M.A. and Ph.D. granting institutions. Few enrolled in four-year liberal arts colleges.
7. Among high school graduates, more boys than girls go on to college. Although sex is a factor in the basic decision between college and non-college, the difference between one state and another in percentage of college enrollment is greater than the difference between one sex and the other.

The most marked sex differences among non-college groups are found for those in Illinois and Massachusetts who did not plan to go (8% more girls than boys).

The heavier attendance of boys at the junior college and Ph.D. granting university level may be the result in part of the higher proportion of girls using the M.A. level colleges which tend to be teacher preparation institutions. Also, there was a much higher proportion of Illinois and Massachusetts girls who neither planned to go nor did in fact go to college.

Massachusetts shows greatest difference in Ph.D. level attendance between boys (23.0%) and girls (10.4%) among the four states.

B. Four-State High School Senior Student Perceptions and Attitudes

1. 80% of the seniors reported that their parents expected them to go to college, although 48% of these seniors did not go to any form of post-secondary school; 50% of the students thought their parents expected them to finish college and/or go beyond.
    a. California and Massachusetts' parents were perceived as having higher educational aspirations for children.
    b. North Carolina's parents were perceived as less ambitious for their children to secure a B.A. or do post-graduate work.
2. There was a strong positive relationship between the type of entry institution and expected level of educational achievement by parents.
    a. 80% of those who did not plan to go and did not go to college reported their parents as having minimal educational ambitions for them.
    b. 86-94% of those who entered college saw their parents as fully expecting them to earn college degrees.
    c. 50% or more of junior college enrollees perceived their parents as expecting them to transfer to an upper division college to get a B.A. or better.
    d. 75% of students whose parents had high expectations, were enrolled in junior colleges and universities.
    e. 90% of students whose parents did not expect them to go beyond high school, did not enroll in any post-secondary institutions.

3. Parents expect their sons to get more education than their daughters (as interpreted by students). For those who do matriculate to a four-year college or university, the aspiration level is higher for girls than for boys to get the B.A. degree, but higher percentages of boys than girls reported their parents expected them to go beyond the B.A. to master's or doctor's degree.

## C. Socioeconomic level and College Choice

1. In all states, junior colleges drew almost equally from the three SES levels although there were less junior college students from "higher than average" family income groups.

2. Modest family income is less of a barrier to enrollment in junior colleges than to enrollment in senior colleges.

3. Students in four-year institutions tend to come from families with higher than average incomes; few students from families with below average income enroll in senior or junior colleges.

   In California, there is low representation in the senior colleges of students from lower income families (availability of junior colleges); Massachusetts' colleges have a high student representation from lower income levels.

   Other than in California, those students from average or below average family income levels were more likely to have no plans to go to college and not to go than to have plans to go to college but then not go.

4. College attendance was more closely related to Father's occupation than to the student's ability level.

   a. Children of Father's in managerial and professional occupations were more likely to enroll in senior colleges than children of blue collar Fathers.

   b. Among SCOPE seniors who neither planned nor went to college, California had a higher percentage whose Fathers were managerial and professional and a lower percentage whose Fathers were in blue collar and service occupations.

   c. In all four states, those who planned to go to college but did not go, registered a higher SES level than those who never planned to go to college and who, in fact, did not go.

d. There was little sex differences by SES.

(1) Sons of blue collar Fathers were more highly represented in junior colleges than their daughters.

(2) The percentage of junior college girls whose Fathers were managerial and professional is higher than boys from this SES level.

5. Differences in enrollment in independent private versus public universities were unrelated to family income.

52% of college-goes from high professional families went to private colleges and universities in contrast to 31% of the children whose Fathers were skilled craftsmen.

a. Across the board separation: 78% public, 22% independent.

b. "Much higher than average" family income: 74% public, 26% independent.

c. "Much lower than average" family income: 78% public, 22% independent.

d. Sex difference in enrollment in independent versus public universities: males: 58% public, 64% independent; females: 42% public, 36% independent.

D. Intellectual Predisposition and College Choice

1. Students with different intellectual predisposition (IPD) scores (based on items from the Thinking Introversion, Theoretical Orientation, and Autonomy scales of the OPI) have different outcomes after high school.

a. Almost half of the students in the lowest quartile neither planned to go nor went to college, and almost half of the students in the highest IPD quartile ended up in four-year institutions.

b. Junior colleges drew students almost equally from all four IPD levels.

c. Those who planned to go but didn't go resembled those who went to junior college rather than those who did not plan to and didn't go.

d. There was very little difference in IPD by state and even less difference by sex.

e. Institutions which attracted the most intellectually disposed students were the independent universities. Over 60% of these students were in the top quartile on the IPD scale and only 5% were in the bottom quartile; over 1/3 of the students who went to independent vocational schools were in the lowest quartile and only 10% in the highest.

2. The accessibility of junior colleges in California attracted those who did not plan to go to college but later changed their minds.

   However, 42% of the SCOPE seniors who went to junior colleges said that they did not want to complete a baccalaureate degree.

E. Race and Educational Opportunity

1. The more select the college, the greater is the proportion of white students in the student body.

   a. There were 90% Caucasians in M.A. and Ph.D. degree granting institutions.

   b. In any one college, there were at least 75% Caucasians.

2. Most minority students who enter college go to junior college.

3. Educational aspirations of racial minorities exceed their actual enrollments. (This may be due in part to the civil rights movement).

   a. More Black students in California than the other three states had aspirations at least equal to those of white students.

   b. American Indians were more content with junior colleges or no college.

   c. Mexican-American students in California and Illinois had lower aspirations than Black students.

   d. Oriental students in California had higher aspirations than white students.

4. Tests of aptitudes and records of achievement have historically been barriers to advancement through higher education.

II. Personal Development

A. Students' Perceptions of Problems

1. The extent to which personal-social issues are perceived as problems is not highly related to students' educational aspirations.

2. However, the extent to which one's political stand is a problem is related to the educational aspirations of females in California, Illinois, and Massachusetts. The higher the educational aspiration, the greater the concern.

B. Educational Aspirations and Religiousness

There is an inverse relationship between concern about one's stand on religion and educational aspirations.

a. Males and females with less extensive educational aspirations are more concerned about their stand on religion.

b. However, males in North Carolina with postgraduate aspirations are also highly concerned.

C. Role-Identification

1. Even with all the instability due to role exploration during adolescence, the extent to which the student identifies with the Protestant work ethic is relatively constant across diverse situations.

2. Several adult-oriented roles are enacted more With Friends than At Home.

There are more items for boys than for girls on which self-ratings With Friends are higher than those At Home. The major differences concern intellectual stimulation ("Stimulates others to think about New ideas") and exploratory mastery ("Encourages others to try new things").

a. Girls find as much opportunity in the home as they do with friends for exploration of these roles.

b. Boys find additional opportunities with their peers.

## III. Vocational Development

A. Students' Perceptions of Problems

1. In general, the extent of students' concern with potential problems related to work is not highly related to their educational aspirations.

2. These variables (those concerned with potential problems related to work) are not related to the educational aspirations for females in California or Illinois; these variables are more consistently related to educational aspirations for males in North Carolina.

3. For males and females, there is a negative relationship between the immediacy of the problem of choosing between an available job versus going to school to prepare for a better job and educational aspirations.

    a. Students with less extensive educational aspirations are more likely to be bothered by the question of work versus school at some time.

    b. Non-caucasians, even those with college aspirations are more likely to be concerned about work versus colleges than their Caucasian peers.

4. The congruence between the ideal and actual anticipated occupations as related to educational aspirations differentiates among the states.

    a. The congruence between the ideal and actual anticipated occupations tends to increase with the level of educational aspirations for males in California and for females in Massachusetts.

    b. Illinois males with post-graduate aspirations tend to indicate a greater degree of congruence while Illinois males with four-year aspirations tend to have low congruence.

    c. North Carolina males with low educational aspirations have more of a problem "deciding what to do if one doesn't get the job he wants".

5. The extent to which learning how one's interests fit with different jobs has been a problem is not related to educational aspirations except with North Carolina males.

6. The extent to which finding out about job requirements and finding out where to train for desired jobs have been problems is inversely related to educational aspirations of males in North Carolina; males in California and Massachusetts show a slight trend in the same direction for both variables.

7. The extent of information gathering about a job is unrelated to educational aspirations.

Critique of Study:

The authors state that the meaning of the variables changed from year to year and that since there was no continuity of the questions from year to year, the focus of the study was constantly changing.

For example, the first survey used Warner's Index to measure socioeconomic status; the final questionnaire measured SES on the basis of occupational prestige.

AUTHOR(S): James W. Trent and Leland L. Medsker

TITLE: Beyond High School

PUBLISHER: Jossey-Bass, Inc., 1968

MAJOR ISSUES:

Although social and behavioral scientists have stressed that basic personality structure is formed early in childhood, and the effect of early environment is critical, there is growing recognition that change, growth, and personality development occur at all stages of life, including adolescence and early adulthood.

If efforts are to be made to improve the preparation of youths to live effectively, it is important to understand how young people develop after adolescence and particularly, how higher education affects human development.

It is essential to determine to what extent the college experience assists or obstructs the development of personality, talents and the making of career decisions requisite for both personal and vocational competence, and to what extent personality development among college and non-college populations relates to change, that is, to a pattern of personality development fairly well established by the time of high school graduation.

OBJECTIVES OF THE STUDY:

General Objective:

To investigate the intellectual and non-intellectual development of high school graduates and to provide information about their patterns of college attendance and employment. (Examination of questions and issues raised by a preliminary study of high school graduates entitled "College Attendance Study").

Specific Objectives:

1. To investigate and delineate the relationship between the rate of college attendance and the type of college available to young people in their community.

2. To investigate the influence of social, cultural, economic and psychological variables on high school graduates' decisions to follow different pursuits after high school.

## MAJOR HYPOTHESES:

### I. Personal Development

A. Personality development defined in terms of growth of autonomy, intellectual interests, and enlightened self-awareness, will be most evident among young adults who persist in college for four years and least evident among their peers who do not enter college (even with the factors of ability and socioeconomic background held constant).

B. Personal and career decisions that affect students' development are part of a lifelong process and are dependent upon family background, living conditions, peer groups, and other individuals and institutions in society.

### II. Educational Development

A. The subsequent development of the entering college student may rest more on his predisposition toward change than on any other factor.

B. The factors which will be found to be related to persistence in college will be the same ones which are associated with change in attitudes and values, and this finding will corroborate the idea of the function of predisposition for change.

1. Before entering college, those who become persisters will indicate a greater interest in college than withdrawals, will have less utilitarian expectations and will manifest more autonomous and intellectual attitudes and interests.

2. After entrance into college, the persisters will choose academic majors in greater proportion than will the withdrawals, and register greater academic motivation as reflected in the relative amounts of time spent, by the two groups, in study and social life.

### III. Vocational Development

A. Young adults who do not attend college are more restricted than college students in opportunities for vocational choice. Noncollege youth do not find, in their working environment, the options and opportunities for exploration necessary for adequate vocational and personal development.

By 1963, four years after high school graduation, those in the sample with some form of post-high school training even uncompleted, will be at a higher occupational level or in a position to achieve a higher level, than those who receive no training after high school.

DESIGN OF STUDY:

1. Longitudinal: four-year period with test-retest on the same sample.
2. Follow-up data on 9,778 of the 10,000 high school graduates who formed the basic sample.
3. Complete longitudinal data from 50 percent of the original sample. No claim is made that the longitudinal sample was necessarily representative of the original high school senior sample. They were similar, however, in important personality and background characteristics.
4. Examination of high school students within comparable communities to determine the differential rate of college attendance associated with the different types of institutions.

DESCRIPTION OF SAMPLE:

1. Size of sample: approximately 10,000 high school graduates.
2. Population: the entire public high school senior class graduating from 37 high schools chosen from 15 communities in the Midwest, Pennsylvania and California. Three additional high schools representing a cross-section of the seniors of the 16th community.
3. Sex: equal representation of males and females.
4. Racial composition: principally Caucasian, 4 percent Negro.
5. Religious composition: 64 percent Protestant; 25 percent Roman Catholic.
6. Sampling procedure: the 16 communities were chosen on the basis of the following criteria:
    a. The sample of communities included ones with a junior college, a freshman-sophomore extension center, a state college, a diversity of colleges or no colleges.

b. Communities were then matched on the following demographic variables:

    (1) Population

    (2) Ethnic background

    (3) Level of income

    (4) Proportion of white collar workers

    (5) Proportion of workers employed in factories and trades

    (6) Number of industries

c. The researchers state that the Northeastern and Southern United States were excluded because of the atypical emphasis on private schools for higher education in the Northeast, and the racial and socio-economic conditions in the South.

7. Limitations of study due to sampling:

    a. No sampling verification procedures for the high school in the 16th community were used.

    b. The selection of high school seniors was not representative nationally due to limitations in the selection of communities and the lack of representation of large metropolitan areas.

    c. The selection of high school seniors was not representative due to the lack of representation of Jews who tend to cluster in large metropolitan areas and who proportionately to their total population have the highest proportion of college attenders.

    d. Male persisters in the college sub-sample were over-represented.

    e. Although the researchers assert that they purposely excluded the Northeast and Southern United States, they also excluded the Northwest and the Southwest was only represented by California.

    f. No attempt was made to correct the various biases by the use of weights or any other technique.

INSTRUMENTS AND MEASUREMENT:

1. Student questionnaire devised by staff was designed to measure:
    a. Academic interests
       (e.g. educational attainment desired)
    b. Extracurricular activities
       (e.g. participation in sports, reading, recreation)
    c. Educational and occupational plans, values and goals
       (e.g. desired occupations, perceptions of educational and vocational training)
    d. Occupational, cultural, political and religious background
    e. Quality and kind of interest and encouragement received from parents
       (e.g. encouragement to attend college)
    f. Post-high school plans of peers
       (e.g. peers' plans to attend college or go to work)
    g. Perceptions of high school teachers and college faculty
       (regarding educational and occupational advice to students and generally, personal encouragement)
2. Structured, open-ended questionnaire devised by staff for the interviews of 500 subjects, designed to measure:
    a. Attitudes, ideas and feelings about family background
    b. Purpose of education (high school, college, and work)
       (e.g. is education intrinsically valuable?)
    c. Marital status
    d. Values, goals and activities
3. Post-card questionnaire for college attenders devised by staff to measure:
    a. Present collegiate activities
    b. Present educational and occupational activities
    c. Residence accommodations

4. Post-card questionnaire devised by staff designed to measure:
    a. The pursuits and activities of high school graduates known to have withdrawn from college
    b. The pursuits and activities of high school graduates not originally entering college
5. Follow-up post-card questionnaire devised by staff designed to measure:

    Current pursuits and activities of those who had attended college

6. Thorndike's 20 item CAVD verbal intelligence test used to measure verbal ability and intelligence of students in the pilot study, College Attendance Study (CAS).
7. The Omnibus Personality Inventory developed at the Center for Research and Development in Higher Education at the University of California, Berkeley, designed to measure:
    a. Autonomy: Nonauthoritarian thinking, need for independence, and the extent to which a person tends to express his impulses in overt action or conscious feelings and attitudes
    b. Level of Anxiety: psychological adjustment, freedom from unusual amounts of anxiety
    c. Orientation towards an experimental, inquisitive viewing of experience and tolerance for ambiguity
    d. Interests in artistic matters, liking for abstract, reflective thought and an interest in a variety of areas such as literature, art and music
    e. Social introversion: the style of relating to people

VARIABLES STUDIED:

1. Student Variables
    a. General background (age, sex, marital status, etc.)
    b. Academic ability and achievement
    c. Degree of personality change
    d. Personality
    e. Values, attitudes, and goals (social, economic, political, religious)

- f. Occupational aspirations
- g. Educational aspirations
- h. Extracurricular activities
- i. Plans for graduate school attendance compared with actual attendance
- j. Post-high school plans of peers
- k. Perceptions of high school teachers and college faculty regarding advice, encouragement, etc.

2. Environmental Variables - Family
   - a. Socio-economic status measured by

     Father's occupation
   - b. Level of education attained by parents
   - c. Home environment
     ( e.g. number of books in home, type of magazines read, etc.)
   - d. Parental-student interaction
     ( e.g. parents' encouragements to attend college, parental advice)
3. Environmental Variables - School
   - a. Rates of college entrance and persistence
   - b. Patterns of withdrawal from college
   - c. Incidence of transfer and relative persistence of transfer students
   - d. Part-time and delayed college attendance
   - e. Type of colleges - types of programs
4. Outcome Variables
   - a. Satisfaction with job
   - b. Stability of employment
   - c. Satisfaction with high school and college experience

STATISTICAL PROCEDURES:

1. Tabulations and cross-tabulations
2. Chi-square tests
3. T-tests to determine significance of differences between correlated means
4. T-tests to determine significance of differences between the change scores
5. Analysis of variance

Critique: No multivariate or covariance analyses were performed.

MAJOR FINDINGS:

I. Educational Development

A. The rate of college persistence and receipt of the bachelor's degree vary according to the type of institution and religious affiliation of the institution.

1a. Persistence was found to be higher for "native" students than for transfer students from two-year colleges.

b. Students who had entered two-year colleges had the lowest persistence rates and those in public four-year colleges had the second lowest.

c. Two-year college transfers had a statistically higher rate of attrition than other students (four-year transfers) even after having attended college two and a half years.

2a. The highest proportion of students who received degrees within four years after graduation from high school were those who had entered church-related universities (58%).

b. Combining denominational and non-denominational, 49% of the students who entered private four-year colleges and universities obtained baccalaureate degrees, and only 30% withdrew within four years.

B. The factors which were found to be related to persistence in college are the same as those which are associated with change in attitudes and values. Specifically, persisters tended to be more intellectual, self-reliant and open-minded before entering college, and even more intellectually oriented and autonomous after four years.

A tenable interpretation of the findings is that the persisters entered college with the necessary intellectual predisposition.

C. Less than 7% of the persisters were at the low level of ability (measured by SCAT score equivalents) compared with 15% of the withdrawals. But 44% of the men and 46% of the women who withdrew were at the high level of academic ability.

Academic aptitude scores of a considerable majority of persisters and withdrawals overlapped.

D. The majority of both persisters and withdrawals were at the middle socioeconomic level for both sexes. Approximately 14% more persisters than withdrawals were at the high socioeconomic level; and at the low socioeconomic level there were 9% more withdrawals than persisters.

## II. Personal Development

A. Personality development and growth of autonomy was most evident for persisters and was evident for those who did not enter college even when ability and socioeconomic status are held constant.

1. Over four years, college men's mean scores on autonomy scales increased by 6 points, whereas, employed men showed a decrease of 1 standard point. Both scores were corroborated by the statistical significance of the difference in in change between the two groups.

2. On the more complex Social Maturity scale, the college students' mean score increased by nearly 10 standard points and the employed high school graduates' scores increased 3.5 points.

B. Personality development and growth of autonomy were found to differentiate between those who entered junior college and those who entered four-year colleges and universities; between students in various types of college and between different denominational and nondenominational institutions.

  1. Students within each type of college changed significantly on the two autonomy scales between 1959 and 1963, with the exception of the private college and university men and the denominational university women on the non-authoritarianism scale.

  2. Positive change in Social Maturity was greatest for private colleges, less for Protestant colleges and least for Catholic colleges.

C. 1. Students who persisted in college showed significantly greater esthetic appreciation than those employed (non-attenders).

  2. Men and women college students were significantly less religious in orientation than their working peers. Within both college and employed samples, men were significantly less religiously oriented than women.

  3. Persisters showed a greater positive change in autonomy than withdrawals or non-attenders.

  4. College persisters gained significantly in their tendency towards reflective thought (Thinking Introversion) and college women gained significantly in inquiry or tolerance for ambiguity (complexity).

  As a group, those who entered employment (non-attenders) showed less tolerance for ambiguity and less interest in intellective inquiry.

  5. Persisters showed greater intellectual and esthetic orientation than employed groups.

  6. More persisters than non-attenders showed interest in cultural activities, e.g. reading preferences, preference for classical music.

D. 1. Of the women, college women were the only ones to increase appreciably in autonomy as measured by nonauthoritarianism scale, (8 standard points). Employed women showed a slight decrease in nonauthoritarianism and the homemakers who married before or immediately after high school graduation showed a mean decrease in nonauthoritarianism of nearly 1.5 standard points.

2. Although all groups of women changed significantly on the Social Maturity scale, the homemakers increased their standard mean scores over four years, approximately 3 points; combined-pursuits group, by 4.5 points; persisters, by 10.5 points.

E. 1. More persisters than withdrawals reported "liking high school very much" (64 versus 52 percent).

2. Nearly 30 percent more of the persisters than withdrawals felt that college was "extremely important". 20 percent of those who became withdrawals reported indifference about the importance of college in contrast to 7 percent of the persisters.

3. More persisters than withdrawals felt it extremely likely they would graduate (43 versus 18 percent).

4. More persisters than withdrawals saw the main purpose of education as the gaining of knowledge and appreciation of ideas (45 versus 31 percent). More withdrawals than persisters viewed the main purpose of education as vocational training (42 versus 28 percent).

5. More persisters than withdrawals reported academic reasons for their choice of college (67 versus 47 percent).

6. More persisters than withdrawals majored in academic subjects (natural science, social sciences, and the humanities) than applied subjects (education, business, and engineering). (83 percent of men and 65 percent of women).

Slightly more men withdrawals than persisters indicated academic problems in college. The difference between the two groups was one only of quality, not type, and the quantity only referred to numbers of problems.

F. 1. More persisters than withdrawals or non-attenders reported their parents as "loving" and having supportive temperaments.

2. Approximately 20 percent more persisters than withdrawals or non-attenders reported while still in high school that their parents definitely wanted them to go to college and encouraged them to do so.

3. More persisters than withdrawals or non-attenders reported parents and relatives, followed by teachers, as their greatest source of help during high school. Friends were considered a source of "help" in frequency only after family, academic teachers, and counselors.

## III. Intellectual Development

A. Intellectual interests will be most evident among young adults who persisted in college for four years and least evident among their peers who did not enter college, even when ability and socioeconomic status are held constant.

1. 71 percent of college persisters reported having browsed in a bookstore at least three times during the past year, compared with 31 percent of the employed men. For women, 81 and 36 percent, respectively.

2. 35 percent of male persisters reported having attended dramatic performances, concerts, public lectures, and art exhibits at least three times during the preceding year, compared with 6 percent of the employed men. For women 50 percent and 15 percent, respectively.

3. A larger proportion of the college persisters than non-attenders liked classical music and maintained and developed their interest in music.

4. More college attenders than employed found the academic profession of great appeal. In general more college students than non-attenders identified more with intellectual occupations than "practical" occupations.

B. Intellectual interests varied according to the type of college entered and also according to the religious affiliation of the institution.

1. Smallest number of graduating college seniors who reported plans to enter graduate school immediately after graduation were those from state colleges (25 percent); 34 percent of seniors in church-related colleges; 30 percent in public universities; 44 percent from private, non-sectarian colleges and 59 percent of private, non-sectarian universities.

## IV. Vocational Development

A. Young adults who do not attend college are more restricted than college students in opportunities for vocational choice.

1. Proportionately, more men with some college experience held a business oriented job, and fewer were in the industrial trades compared with the men without any college experience.

2. Over 40 percent of the men and 20 percent of the women who did not enter or persist in college stated that they had difficulties in finding a job they wanted; 13 percent reported they had difficulty finding a job at all. Proportionately more college non-attenders than college withdrawals experienced unemployment (24 versus 19 percent, respectively).

3. Of those who were employed full time in Sept., 1959 and remained consistently employed throughout the four years of the study, the majority of men worked in some area classified as lower level Technology and most women held clerical job. Jobs classified according to systems devised by the U.S Department of Labor (1965) and Roe, The Psychology of Occupations (1956).

4. Rate of unemployment was highest among the noncollege men: 34 percent were unemployed some time during the four years of the study; 4 percent of the noncollege men were unemployed a total of more than one year.

B. More withdrawals than persisters reported vocational training as the "Primary Purpose of Education" (42 percent of withdrawals; 28 percent of persisters).

C. 1. A greater proportion of youths at the high level of ability who could be expected to reach a professional occupation level did express a desire to work at such levels. 54 percent men and 68 percent women withdrawals desired a profession compared to 34 percent of men and 39 percent of women of high ability who did not enter college.

2. More withdrawals achieved higher occupational levels, as a group, then did those who did not attend college at all.

D. 1. There was no statistically significant relationship found between socioeconomic status and occupational choice for any of the groups.

2. Those individuals reporting high level of occupational aspirations also had a high level of ability. 54 percent of men and 68 percent of women withdrawals desired a profession compared with 34 percent of the men and 39 percent of the women of high ability who did not enter college. At the low ability level, 40 percent of those who withdrew from college desired a profession whereas only 17 percent of the non-college subjects did so.

3. There was no statistically significant relationship found between geographical mobility and occupational aspirations.

4. Proportionately more individuals who attended junior colleges or schools with specific vocational orientations reported high level of occupational aspirations than those who had no formal post high school training.

E. 39 percent of the persisters compared with 22 percent of the noncollege men felt liking their work was most important. 26 percent of the noncollege men and 6 percent of the persisters felt that steadiness of employment contributed most to a satisfying job.

CONCLUSIONS:

1. Although college attendance and performance appeared to be related to native ability, socioeconomic background, and community educational opportunities, other factors singly and interdependently associated with college attendance were: students' perceptions of their parents as emotionally supportive, alert, and interested in their progress; a view of education as worthwhile in itself rather than as utilitarian vocational training; academic motivation; personal autonomy and non-authoritarianism; intellectual disposition; and the decision to attend college before entering high school.

2. High school graduates entered the work world with little understanding of it, and often with too little preparation. These conditions, together with the limited ability of many, may have been responsible in part for the lack of choice so many of them had about the kind of jobs they found. They accepted what was available for security and satisfaction of basic needs, but were not actively open to gaining greater awareness of the world, testing it, or becoming committed or involved in it.

3. College seems to foster, or at least facilitate, the growth of autonomy and intellectual disposition, whereas, early employment and marriage seem to retard and even suppress development of these traits.

4. Since society outside of college apparently does not encourage autonomy or intellectuality, either the burden of nurturing the potential of at least half of the nation's young adults must be carried by the high school or other non-collegiate agencies, or college must extend its influence in ways that have not traditionally been considered its function.

5. It may be that the college students who increased most in autonomy and intellectual disposition were pre-disposed to make use of those opportunities in colleges that were most likely to encourage these traits.

6. Educational opportunity is clearly not yet equalized in the form of community facilities and social environment. Large numbers of able youths place little or no value on higher education and demonstrate few signs of intellectual or innovative behavior. Still larger numbers either did not attend college or withdrew before graduation, and even those who do graduate from college exhibit too little of the kind of intellectual development and flexibility required in an age marked by so much change. Many young people betray ineptness in making basic decisions and assuming adult roles.

## RECOMMENDATIONS:

Experimentation in the schools, along with evaluation, should include:

1. A collaboration of college, high school, elementary school teachers and counseling personnel in special courses and programs at all grade levels.
2. The establishment, from the junior year of high school through the sophomore year of college, of "moratorium" intermediate colleges to explore the meaning and achievements of society, and the values, characteristics, occupations, and activities of its members and groups.
3. A greater use of tutorials, seminars, and electronic teaching aids and more reliance on field work.
4. The nature of the school--its purposes and how it is to operate--increasingly needs re-examination, as does the assessment of the effectiveness of specific curricula, teachers, course; innovation and experimentation.

I. Persistence in college is related to:

A. Environmental Variables--Family

1. Father's occupational level (SES):

14% more persisters than withdrawals (men) and 15% more persisters than withdrawals (women) at high socioeconomic level. At the low socioeconomic level, 9% more withdrawals than persisters ($P < .01$).

2. Source of support:

10% more male withdrawals than persisters reported that wages from part-time work accounted for over half of their income ($P < .01$).

3. Parental encouragement to go to college:

20% more persisters than withdrawals or non-attenders reported while still in high school that their parents definitively wanted them to go to college.

4. Source of help and advice:

More persisters than withdrawals or non-attenders reported parents and relatives, followed by teachers, as their greatest source of help during high school.

B. Student Psychological Variables

1. Appreciation of high school:

   More persisters than withdrawals reported "liking high school" very much (64 versus 52%).

2. Perception of college as important:

   30% more of persisters than withdrawals felt college was "extremely important". 20% of those who became withdrawals reported indifference about the importance of college in contrast to 7% of the persisters.

3. Perception of their likelihood of graduating:

   43% of the persisters compared to 18% of the withdrawals felt it extremely likely they would graduate.

4. Level of educational aspiration:

   Of men who originally planned to attend college for four years, 62% persisted that length of time; of those who had no plans, 48% of men persisted. Figures for women 53% and 31%.

5. Growth in autonomy (OPI):

   Over four years, college men's mean scores on autonomy scales increased by 6 points; employed men decreased one standard point. College women's scores increased by 8 standard points. Employed women showed a slight decrease in nonauthoritarianism and homemakers who married before or immediately after high school graduation showed a mean decrease of 1.5 standard points ($P < .01$).

6. Growth in social maturity:

   College students' mean score increased by nearly 10 standard points; employed high school graduates' scores increased 3.5 points. Women persisters' 10.5 points; homemakers, 3 points and those who combined pursuits, 4.5 points ($P < .01$).

7. General personal growth and development:

   a. Esthetic appreciation
   b. Reflective thought
   c. Tolerance for ambiguity
   d. Interest in intellective inquiry

8. Interest in cultural activities:

   More persisters than non-attenders showed interest in cultural activities, e.g. reading preferences, preferences for classical music, evaluation of different types of occupations.

9. Perception of purpose of education:

   More persisters than withdrawals (45 versus 31%) saw main purpose of education as gaining of knowledge and appreciation of ideas. More withdrawals than persisters (42 versus 28%) viewed main purpose of education as vocational training.

10. Reasons for choice of a college:

    More persisters than withdrawals reported academic reasons for their choice of college (67 versus 47%).

11. Perception of parents as "loving" and supportive:

    More persisters than withdrawals or non-attenders reported their parents as "loving" and having supportive temperaments.

12. Sex of student:

    Proportionately more men than women persisted in college for four years; proportionately more women than men obtained degrees in this time. 1/3 of women versus 1/4 of men obtained degrees but nearly twice as many men as women remained in college consistently without obtaining a degree within a conventional four-year period 31 versus 16%).

13. Vocational

C. Student Behavioral Variables Aspirations

1. Level of ability (SCAT score equivalents):

   Less than 7% of persisters were at low level of ability compared with 15% of the withdrawals. But 44% of men and 46% of the women were at the high level of academic ability.

2. Academic majors:

   More persisters than withdrawals majored in academic subjects (natural science, social sciences and the humanities) than applied subjects (education, business, and engineering). For men 83 versus 73%; for women, 71 versus 65%.

3. Type of vocation:

   Proportionately more men with college experience held a business-oriented job, and fewer were in the industrial trades compared with the men without any college experience.

4. Ease of finding a job

D. Educational Variables

1. Type of institution:

   Students who entered private four-year universities had highest persistence rates: 49% obtained B.A.'s and only 30% withdrew within four years; four-year colleges and two-year colleges had lower persistence rates.

2. Religious affiliation of institution:

   Highest proportion (58%) of students who received degrees within four years after high school graduation were those who entered church-related universities.

3. Type of first institution:

   Persistence was higher for "native" students than for transfer students from two-year colleges.

II. Personality development and growth of autonomy were found to be positively related to:

A. Educational Variables

1. Type of institution:

   Students within each type of college changed significantly ($P < .01$) on two autonomy scales between 1959 and 1963, with the exception of the private college and university men and the denominational university women on the non-authoritarianism scale.

2. Religious affiliation of institution:

   Positive change in Social Maturity was greatest for private colleges, less for Protestant colleges and least for Catholic colleges.

3. Persistence in college

III. Intellectual interests were found to be related to:

A. Educational Variables

1. Type of institution:

   Smallest numbers of graduating college seniors (25%) who reported plans to enter graduate school immediately after graduation were those from state colleges; 34% of seniors in church-related colleges; 39% in public universities; 44% from private, non-sectarian colleges and 59% of private, non-sectarian universities.

CRITIQUE OF THE STUDY:

1. The objectives of this study called for a descriptive survey of the population of high school students in the United States. By eliminating the South, the Northeast, and much of the West, areas of large ethnic populations have been deleted.

2. A major assumption underlying the conceptualization of this study is that the "world of work" as a whole represents the single alternative experience to college attendance. A breakdown of the "world of work" into differential categories might have revealed more variant personality outcomes.